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Published every Monday. Single copies 25 cents (except special issues). Subscription price: domestic and foreign, $2 a year; 2 years, $3; 3 years, $4. Advertising rates on application.
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The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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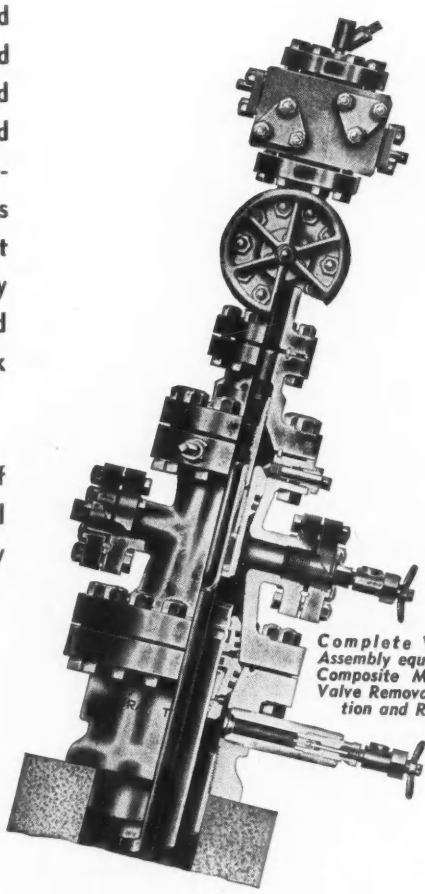

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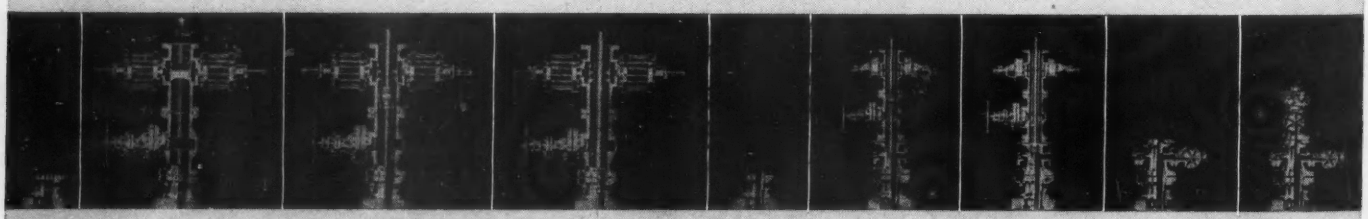

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THE WEEK'S NEWS

OGD Director Max W. Ball pledges a policy of non-interference by the government with a free petroleum industry and envisions the NPC as the watchdog to see that the pledge is kept. Story below.

TET-Big Inch Clearance—Tennessee Eastern Transmission Company, given clearance by the Department of Justice for purchase of the Big Inch pipe lines, faces a long and bitter fight before the Federal Power Commission. Indications are that application of Trans-Continental Gas Pipe Line Company for a competing line may be held up until TET case is disposed of. Page 25.

Natural Gas Act Changes—A long-deferred overhauling of Natural Gas Act is sought by Representative Ross Rizley of Oklahoma through legislation embodying the ideas of the natural-gas industry, an important feature of which is denial to the Federal Power Commission of any jurisdiction over the production or gathering of gas. Page 26.

International Trade Agreements—IPAA Counsel Russell B. Brown attacks international control potentialities of the proposed International Trade Organization as President Truman strengthens the "escape clause" procedure and provides more adequate consideration of industry complaints against tariff cuts. Page 25.

Forecast for March—The Bureau of Mines this week will forecast an increase demand for crude during March, 4,745,000 barrels daily against 4,640,000 for February. Page 23.

Deepest Well—The week's end found Superior Oil Company of California's well in Caddo County, Oklahoma within 10 feet of a 17,000-foot depth. Story below.

Rubber Control—With one month's time, Congress begins consideration of legislation to continue the government rubber purchase and allocation program beyond March 31 pending adoption of permanent legislation for support of the synthetic industry.

Canol Project Offered—The government spent nearly $70 million on Canol Project 1, but only $15 million is worth salvaging, it is disclosed by the Foreign Liquidation Commissioner in asking bids for the sale of the Whitehorse refinery, pipeline and other facilities. Page 27.

Natural Resources Inventory—Cost of inventorying our natural resources will be $100 million instead of $1 billion, as estimated by Interior Secretary J. A. Krug, but Congress appears reluctant to buy it at any price. Page 26.

Anadarko Basin Discovery—Discovery of a deep field north of Lindsay, Okla., may be another outstanding strike for the Anadarko Basin. Page 47.

Legislation Would Avoid Tidelands Wells Shutdown

The Department of Commerce, looking ahead, has asked the Department of Justice to help draft legislation that would care for the California coast production situation provided the Supreme Court decides that tidelands title rests in the federal government. Actual legislation will not be asked unless such a decision is reached, but the Interior was anxious to avoid "a catastrophic sudden shutdown," which might be damaging to the wells themselves.

The Interior's prospective policy is to continue all tideland leases for their full period and not require any accounting for past production or royalty payment to the U. S.

Record Well Now Below 16,990-Foot Depth

The world's deepest test Friday was drilling below 16,990 feet and an official of Superior Oil Company of California said no decision has yet been reached as to when the drilling would stop. Drilling was proceeding slowly ahead.

The well, Weller 51-11, NE NW NE 11-8n-12w, near Fort Cobb, in Caddo County, Oklahoma, is said to be capable of going down to at least 20,000 feet.

A tight hole, some reports state unofficially that shows were encountered between 12,000 and 16,000 feet, while other unofficial reports insist that no commercial shows have been found.

Eastern Gas Allocation

Members of the Federal Power Commission's industry advisory committee on allocation of gas moving through the Big Inch lines will meet Wednesday to review allocations for the current month.

Ball Sees Great Benefits from OGD And New National Petroleum Council

Max W. Ball, director of the Oil and Gas Division, last week debunked the more or less widespread belief that the OGD was planning to swallow all the oil and gas activities of the federal government and become a dictator over the oil industry.

In an address before the San Joaquin Valley Oil Producers Association at Bakersfield, Cal., Ball hit hard at the idea of government control and assured the industry that no one agency in the Federal Government possibly could handle all of the government's activities in the field of petroleum.

"The oil and gas division has no power to direct the industry or anyone in it. It does not want such power. Except in time of national emergency, it should not have such power. It should not be so constituted that its director will be tempted to exercise such power,"

Ball emphasized the distinction between regulatory powers, such as enforcement of the Connolly Hot Oil Act, and the direction or control of the industry.

"I do not believe in government control of private industry, beyond seeing that the game is played fairly according to the rules," he declared. "I am opposed to government control or a planned economy; I hold that every step toward a planned economy is a step toward regimentation and a totalitarian state. When economic liberty is strangled, political liberty dies with it."

His own convictions, he told the association, are also the convictions of Secretary of the Interior J. A. Krug.

Ball outlined OGD's responsibilities, and asserted that the President's instructions to centralize governmental activities relating to petroleum, where "practicable and appropriate," does not contemplate the creation of a great centralized agency exercising all of the government's many functions relating to oil and gas.

"Even though such an all-inclusive agency were practicable, it would be dangerous," he said. "Such an agency would be powerful. Its head might be tempted, when things did not go to suit him, to try to direct the industry as well. In the name of wisdom and a free industry, such temptation should be avoided."

Shifts If Desired

Within these limitations, Ball continued, there is much the OGD can do to coordinate, unify and centralize the government's operations in the field of oil. Study already has shown that some 22 departments and agencies, and perhaps three times that number if bureaus and divisions within departments are included, do something relating to oil or gas.

"Shifting of these functions will be recommended when they are convincingly desirable," he declared. "I am sure that there will not be enough shifts to make the OGD the great all-embracing petroleum agency that some people thought we were out to create."

There is less doubt as to the necessity of coordination and unification of administrative policies, Ball pointed out,

to prevent one federal agency from interfering with another.

A primary responsibility of OGD, he said, is to consider and recommend such steps as may be necessary to safeguard our petroleum future, a problem which "may vitally affect not only a great and essential industry, but even the future of the nation itself."

Although it has many important duties, the OGD has very little direct authority, Ball emphasized. It has no power over the industry, nor any over other government agencies; if its recommendations are not followed, it can only appeal to the head of the department concerned, through the Secretary of the Interior, or, as a last resort, to the White House.

"If the division is as wise, as vigilant, and as forceful as its duty calls for it to be, its voice will be heard and its recommendations will be listened to," he commented. "I am far more interested in the division's influence than in its authority."

Ball assured that OGD plans to "stay strictly and severely out" of the regulatory and administrative business of the state bodies with which it is to serve as liaison.

Ball envisaged an important role for the National Petroleum Council, which he said, already has a record of accomplishment.

"The council's attitude of helpfulness has been so marked that I'll not argue with their occasional refusal of a request—not, that is, until they say 'no' to something we really need and see no other way to get. We'll cross that bridge if and when we come to it; cross it arm in arm, even though we argue vehemently while we are crossing."

But the council has possibly a more important function as the watchdog of the industry over the government.

"It will always be well informed as to the things we do, because it will furnish us many of the tools with which to do them," Ball said. "If ever the OGD should take a step toward government control of the industry, the council would know it, and we and the world would know it, promptly and emphatically."

Safety and confidence for both the industry and the government are assured by the fact that the latter cannot delegate any of its responsibilities to the council, and must itself make the final decisions after receiving the council's advice, he pointed out.

Allen Jergins, vice president of Jergins Oil Company, last week was reelected president of the San Joaquin Valley Oil Producers Association for another term. H. F. Owen, vice president of Berry Oil Company, and C. C. Spicer, president of Republic Petroleum Company, were elected vice presidents, and Charles Premo was reappointed secretary.

IPC Offices "Under Siege" at Haifa

By HENRY OZANNE
Staff Writer (in Beirut)

Iraq Petroleum Company is operating "in a state of siege" at its home offices in Haifa, Palestine. The company has evacuated to Beirut, Lebanon, 110 family members, including 27 children, of company employes; and has split its Middle East headquarters operations between Haifa and Tripoli, Lebanon.

The evacuation is in compliance with British orders governing Palestine, and Beirut was chosen as temporary refuge for the families following the refusal of all the English wives to return to London. A home has been set up for the evacuees at Rumana, 20 miles out of Beirut in the Lebanon Mountains where a summer hotel has been taken over for accommodations, and a school opened for the children.

Meanwhile the company personnel remaining at Haifa are living behind a barricade of barbed wire on Mt. Carmel, near IPC headquarters. A skeleton staff mans the office every day, escorted to and from work by detachments of Palestinian police. Communication is maintained between the "fortress" on Mt. Carmel and the office itself by radio and telephone. Occasionally couriers get through, and every few days a mail car makes the trip from Haifa to Beirut and Tripoli. IPC has prepared for an indefinite condition of such "siege."

The company's entire production staff in the Haifa office has been transferred to Tripoli, while the personnel remaining in Haifa is chiefly concerned with maintaining the pipe line terminal. Since the death on January 29 of M. M. Stuckey, for years IPC's Middle East manager, managerial duties there have been divided between George Heseldin, now heading the Tripoli contingent; and Jeffrey Herridge, in charge at Haifa.

IPC has suspended all exploration work and other operations in Palestine. The field personnel at the Gaza location has been withdrawn and transferred to Tripoli.

Rock Island Buys Onyx; Gets Big Crude Runs

Rock Island Refining Corporation, owner of refineries at Duncan, Okla., and Rock Island, Ind., gained control of 10,000 barrels daily of Mid-Continent grade crude runs in West Central Texas in purchasing the entire stock of Onyx Refining Company effective March 1 for a reported $1 million. Rock Island proposes to spend a substantial sum immediately in modernizing and enlarging the plant.

Onyx has 77 miles of gathering and discharge lines in Jones and Taylor counties, and receives a substantial volume of crude daily by tank trucks from isolated fields. Its crude skimming and cracking plant, situated 9 miles north of Abilene, was acquired in 1935 and has been increased by stages from 800 to 3500 barrels daily.

Navy Deal for Mid-East Oil Subject of Letter

C. C. Barthelmes, for several years connected with Standard Oil Company of California and later, until January, connected with the Washington office of Arabian-American Oil Company in a letter last week to President Truman questioned the deal whereby Arabian-American oil is being furnished to the U. S. Navy. He said the company is making undue profits therefrom and that the participation of Standard Oil Company (New Jersey) and Socony-Vacuum Oil Company will give the group "tremendous control of world oil" and possibly lead to war. He charged that the oil sold had been judged not satisfactory for Navy use.

The Navy Department issued an official statement that while the oil in question is not suitable for general use, it is entirely suitable for the purposes made of it. It is the cheapest of all the oils it buys, and to purchase it elsewhere would cost 42 percent more in addition to increased hauling charges, the Navy said, adding "a complete inspection service is maintained in the Middle East, and every shipment is tested and those found unsatisfactory are rejected."

James Terry Duce, Arabian-American vice president, declared that the company has at all times cooperated with the Navy and has consistently complied with the Navy's requirements. He pointed out that the Mid-East deal with the two Standard companies has not been completed, but has been discussed with various government officials and when final arrangements are made the participating companies will issue a statement.

State Policy Upheld

Louisiana's policy of restricting natural gas export to areas provided with other fuels for industrial use can be legally enforced by the orders of the state's Conservation Commission, Attorney General Fred S. Leblanc has ruled.

The ruling likely will have an affect on the allowable fixed by the commission for the Lucky field in Bienville Parish where the H. L. Hunt interests have been at odds with state officials over delivery of gas to the Big Inch lines.

Tennessee in Compact

Membership of the Interstate Oil Compact Commission was increased to 18 states Friday when Governor Jim Jance McCord signed the compact following passage of a bill by the Tennessee Legislature authorizing such action.

Over-Production Extended

Texas Railroad Commission emergency orders under which Lone Star Gas Company was permitted to produce during January and February 60 million cubic feet of gas daily in excess of allowable from its connections in the Carthage field, Panola County, were extended last week until April 1.

Brown Opposes Controls Proposed in ITO Charter

Potential international control of the domestic operations of American oil companies through the medium of the proposed International Trade Organization under the aegis of United Nations was attacked last week by Russell B. Brown, general counsel of the Independent Petroleum Association of America, as the Executive Committee on Economic Foreign Policy opened a series of hearings on its proposed charter.

Emphasizing that he was not opposed to the ITO "in broad principle," Brown demanded that before the U. S. becomes tied down by definite commitment the State Department enunciate an explicit policy with respect to petroleum, and announced the willingness of the IPAA to sit, with others from the industry and Government, in consultation for determining the impacts of the proposed charter.

Brown charged that through the agency of the Trade Agreements Act a world monopoly in petroleum is being created, that imports of foreign oil are increasing rapidly and exports from continental United States decreasing steadily, and these developments, if continued, will make impossible the maintenance of a strong, healthy industry in the U. S.

Brown said that Article 25 of the charter, prescribing quantitative restrictions, might at some future time be the only practical means of preventing the elimination of the domestic independent petroleum industry. He also attacked Article 34, providing an "escape clause" and the articles relating to the conservation of exhaustible natural resources and inter-governmental commodity arrangements.

Conservation, Brown declared, is a matter for state jurisdiction, not for the federal government nor an international organization, while the projected international commodity arrangements constitute "national economic planning" which the country is not ready for.

President Truman last week killed the likelihood of congressional action to restrict the State Department in its negotiation of new trade agreements by an executive order requiring the incorporation in all trade pacts of an escape clause under which concessions threatening serious injury to domestic producers may be modified or revoked and providing also that any interested party may demand an investigation by the Tariff Commission of any situation where a flood of imports coming in under an agreement threatens domestic production.

Louisiana Allowable

The Louisiana Conservation Commission has set the State's allowable for March at 449,618 barrels daily, an increase of 2709 barrels daily over February. In raising the allowables, increases were ordered for Lafayette up 1598 to 122,172; New Orleans up 1970 to 93,975; and Monroe up 86 to 67,738. Decreases were ordered for the three other disrticts.

March Demand Up

The Bureau of Mines this week will forecast an increase in demand for domestic crude this month to 4,745,000 barrels daily from 4,640,000 barrels in February, with Texas production rising from 2,030,000 to 2,064,000 barrels. Kansas output is seen increasing 7000 barrels to 270,000 daily, and Oklahoma 5000 to 370,000 barrels.

Statistics compiled by the bureau indicate that demand has been running so high that the higher level of actual runs have been absorbed and stocks have been materially reduced. Residual oil is becoming tighter, and gasoline stocks have reflected the trend, although distillate still is a little out of balance on the high side.

It is now indicated that total demand for the first quarter may be as much as 2 percent higher than originally estimated, and that gasoline demand will be at least the 177 million barrels estimated in the last revised forecast. Second quarter demand also is seen as probably running above estimates, but the outlook for the final half of the year so far is unchanged.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED March 1	February 22
Alabama	900	1,000
Arkansas	74,500	74,000
California	901,500	902,400
Colorado	38,000	37,700
Florida	115	240
Illinois	196,200	191,000
Indiana	17,750	17,500
Kansas	271,800	280,350
Kentucky	27,200	27,200
Louisiana	404,800	404,950
North Louisiana	94,500	94,650
South Louisiana	310,300	310,300
Michigan	41,500	40,500
Mississippi	85,550	83,250
Missouri	100	100
Montana	24,000	23,000
Nebraska	700	700
New Mexico	103,900	103,900
New York	13,200	12,750
Ohio	7,800	7,000
Oklahoma	369,150	370,050
Pennsylvania	34,800	33,250
Tennessee	35	35
Texas	2,056,665	2,056,665
Tex. R. R. Comm. Districts:		
Dist. 1—S. Central	19,950	19,950
Dist. 2—Lower Gulf Coast	146,025	146,025
Dist. 3—Upper Gulf Coast	451,000	451,000
Dist. 4—S. West	223,250	223,250
Dist. 5—E. Central	36,440	36,440
Dist. 6—E. Texas Field	328,200	328,200
Dist. 6—Rest of N. East	106,100	106,100
Dist. 7-B—W. Central	36,100	36,100
Dist. 7-C—West	32,665	32,665
Dist. 8—West	467,455	467,455
Dist. 9—N. Central	126,355	126,355
Dist. 10—Panhandle	83,125	83,125
West Virginia	7,500	6,500
Wyoming	110,000	106,750
Total United States	4,787,665	4,780,790

Total stocks, foreign and domestic February 22, as reported by the Bureau of Mines were 222,580,000.

Big Inch FPC Certificate Plea Expected Immediately

Texas Eastern Transmission Corporation and the men behind it last week were given a clean bill of health by Attorney General Tom Clark, who advised War Assets Administrator Robert M. Littlejohn that he saw nothing in the proposed Big Inch deal in contravention of the antitrust laws. Littlejohn immediately sent the company a "letter of intent," which in effect was a bill for $1 million payable in five days. Another $4 million is due when the company takes over the lines, under an interim lease, when Tennessee Gas and Transmission Company's lease expires April 1.

Attorneys for TET and WAA are working on the terms of the lease, under which the company is expected to contine to supply natural gas to the Ohio area until it can get the lines ready for big-scale permanent service.

The one hurdle that remains is getting a certificate from the Federal Power Commission. Coal, labor, railroad and other interests are expected to continue to oppose conversion and it is estimated that it may take as much as a year to reach a show-down with FPC. However it will be nine to 15 months before WAA can finally turn over the lines, due to the necessity for settling condemnation suits filed by the government to make good the rights-of-way title.

TET is expected to move quickly to file its application with the FPC.

A telegraphic request by Claude A. Williams, president of Trans-Continental Gas Pipe Line Company, for a quick hearing on its application for authority to construct a natural gas transmission line from Texas to the Eastern seaboard apparently has not stirred FPC and it appears probable that the commission will want to pass on the Big Inch pipe lines before taking up any applications involving the same areas.

So far, FPC officials said, Trans-Continental is the only applicant to file for a line to compete with the Big Inches in the New York-Philadelphia area, although Memphis Natural Gas Company last month submitted an application for a line from Texas to Pittsburgh, Pa., which would be based on its own present system and that of the Kentucky Natural Gas Corporation.

Special Events Group

Richard Rollins, secretary and director of public relations of The Atlantic Refining Company, has been named chairman of an industry special events subcommittee. Franklin Waltman, chairman of the Public Relations Operating Committee, said the subcommittee will make recommendations on special events showing the progressive nature of the petroleum industry.

Smullen Resigns

James D. Smullen, head of the oil, gas, rate and motor transportation division of the Texas Attorney General's Department, will leave his present position on April 1 to enter private law practice in Austin.

Congress Asked to Amend Natural Gas Act Even Before FPC Divulges Views

The natural gas industry's expected drive for reform of the Natural Gas Act was launched last week by Representative Ross Rizley of Oklahoma, who introduced legislation which not only would alleviate many of the conditions complained of by the industry but also would free oil operators definitely of all fears that they would be subject to Federal Power Commission control by reason of the sale of gas produced in connection with their oil.

Running directly contrary to the philosophies of the commission as expressed in its various decisions, the bill would define more exactly the limits of commission authority. In many respects, it is believed to cut across recommendations the commission is expected to make when it reports to Congress on its natural-gas investigation.

Rizley contends the FPC has "reached out beyond the limits of the law" to impose "undue burden" over the natural gas industry and charged that under the FPC the industry has been "hamstrung" and that the consumers and potential consumers "have been unable to obtain adequate supplies of natural gas."

A similar bill is scheduled to be introduced in the Senate by Senator E. H. Moore of Oklahoma.

Provisions of Bill

Provisions of the Rizley bill would include:

1) Prevention of the FPC from controlling directly or indirectly the use which is made of natural gas.

2) Prevention of FPC from taking jurisdiction, directly or indirectly, over direct industrial sales.

3) Prevention of the agency from taking jurisdiction over production and gathering activities, either directly or indirectly.

4) Prevention of FPC from taking jurisdiction, either directly or indirectly, over the activities of local distributing companies.

5) The elimination of compulsory original cost depreciated method and the substitution of the field price method, in determining operating costs, for rate-making purposes.

6) Compelling the agency to allocate costs properly between jurisdictional and non-jurisdictional classes of properties, revenues and expenses, in determining the rate base.

7) Compelling FPC to expedite action on applications for certificates.

Speedier Action

For rate-making purposes, FPC has asserted jurisdiction over production and gathering of natural gas, thus discouraging oil companies from selling their gas, Rizley said. By its actions, he contends, the FPC has defeated efforts of the various states and the industry itself to practice conservation, because companies primarily interested in producing oil now are fearful that if they should sell their gas to interstate pipelines they will be subject to FPC jurisdiction, which would mean limiting their profits to six or 6½ percent, and compelling them to submit to FPC accounting practices.

The representative said that naturally "they decline to put themselves in this position, and there are large amounts of gas which otherwise would be available to meet the great market demands that is not now getting to market."

To speed up action on applications, the bill would eliminate the necessity for hearings in uncontested cases, and require that in contested cases hearings be set and expedited within 30 days after notice of protest is filed.

"Under the present procedure in certificate cases," Rizley asserted, "delays have at times been insufferable. Interventions have run riot. Costs have mounted. Time-killing procedure has been engaged in. The dockets of the FPC have bogged down."

The whole bill, Rizley said, represents the composite judgment of every segment of the natural gas industry. Industry spokesmen said it provides for a long overdue revision of the act to clarify provisions which have been so construed by the commission as to an ever-increasing expansion of its asserted authority.

The measure goes to the House Interstate and Foreign Commerce Committee, many members of which are thoroughly conversant with the oil and gas industry and which has never evidenced any great sympathy toward the expansion of federal controls. FPC members at a private session with this committee during the week expressed their opposition to the amendments proposed by Rizley.

$2.5 Million Is Asked for Resources Inventory Survey

Interior Secretary J. A. Krug's recommendation for an inventory of our natural resources, which he said might cost $1 billion and take 20 years, has been getting a going-over from a House Appropriations subcommittee, asked to provide $2.5 million for initiating the work.

As outlined by U. S. Geological Survey officials, the work would cost $100 million—not $1 billion—and would consist of a thorough mapping of the entire country with a view to determining, among other things, the beds of ancient seas and the shorelines along which are found the stratigraphic traps containing oil and gas.

The work of the survey would result only in the delineation of areas showing possibilities of oil or minerals. If an actual inventory was to be made on the basis of the survey's showings it might well cost $1 billion for test drilling, etc., but it is quite possible that before this could be finished the oil and mineral industries might move into the more promising areas.

Complete mapping of the country, it is estimated, would take 20 years and if, as suggested by Krug, the work was speeded up it could be done only by concentrating on particular areas or by putting on such a large organization that the expense would rise unduly and administration be made difficult.

A by-product of the work would be more detailed information on paleogeography and study of other data indicating the presence of oil. Survey officials would put oil high on the list of resources to be searched for.

The $100 million cost would likewise be prorated over the 20 years required. The $2.5 million sought for the year beginning July 1, next, would cover largely the program's final development and necessary organization work.

Secretary Krug's $1 billion estimate, however, has drawn the fire of engineers and geologists and also may have scared off an economy-minded Congress. There is a definite possibility that the House subcommittee may throw out the item, as the Bureau of the Budget did the department's request for a like sum to start Continental Shelf exploration.

Repeal of Unitization Law Sought by Oklahoma Group

Repeal of the 1945 unitization law in Oklahoma has been asked by 200 state land and royalty owners who contend it permits a few big oil companies to pool and hold thousands of undeveloped acres at the expense of land owners.

Revision of the unit operation law is indicated following the protest, and Sen. Homer Paul, chairman of the Senate Oil & Gas Committee, reported he would name a special committee to work on an amendment.

L. A. Davis, Chickasha, Okla., president of the Grady County Land & Royalty Owners Association, and spokesman for the group, said the owner of nonproductive acreage would benefit from production on the land of his neighbor under the present law.

Davis said big operators are "bottling up" Oklahoma oil pools while importing cheaply-produced oil from South America at the rate of more than a million barrels a day.

Dan Knowlton, Oklahoma City geological engineer, defended the law, declaring that the unitization plan has been tried only in one state pool, and that it had proved highly successful. He said that with unitization and pressure maintenance as much oil was produced in the South Burbank field of Osage County in nine years as could be produced in the North Burbank field in 45 years under the so-called competitive system of development.

Ball to Compact

Max W. Ball, director of Interior Department's Oil and Gas Division, and Alec M. Crowell, head of OGD's production section, will attend the Interstate Oil Compact Commission's executive committee meeting in Oklahoma City, March 8.

Canol Project 1 Offered For Sale by Government

The Foreign Liquidation Commissioner has invited bids, to be opened March 27, for the sale "where is-as is" of the facilities known as Canol Project 1. Examination of the equipment will be possible only by a personal tour of the 513-mile stretch from Norman Wells to Johnson's Crossing, 80 miles southeast of Whitehorse.

Canol Project 1, representing a government investment of $69,534,286, has a saleable value of about $15 million, but it is expected any offers made will be only a fraction of that amount.

One of the lots consists of the refinery at Whitehorse; another includes a power plant and about $1 million worth of tankage and other lots include the 577-mile pipe line and pumping stations, crude storage tanks and miscellaneous equipment.

Pipe Soon for Stanolind West Texas Extension

Stanolind Pipe Line Company is scheduled to receive initial shipments of pipe soon for the extension of its West Texas-Oklahoma 16-inch trunk line south to connect some of the largest sweet and semi-sweet crude producing areas in the Permian Basin.

This project (THE OIL WEEKLY, November 18, 1946) involves construction of a 43-mile 16-inch unit from its Wasson field pump station and tank farm to the south portion of the Fullerton field, Andrews County, and 36½ miles of 16-inch from the latter point to the south end of the Wheeler field. Booster stations at Fullerton and Wheeler will be equipped with gas-engine-powered centrifugal pumping units. Four 107,000-barrel capacity tanks will be installed at the Fullerton station site, and two of the same size at the Wheeler station.

Pasotex Line from Wink Is Given Pressure Test

Pasotex Pipe Line Company, a unit of Standard Oil Company of California that delivers Permian Basin crude to refineries in the El Paso area, is making pressure tests of its 98 miles of 10-inch extension line to the Yates field, Smith Contracting Company having finished its work.

The new unit connects with Wink terminal and tank farm, Winkler County, on Pasotex's 195 miles of 8-inch trunk line to El Paso. The latter transports from 19,000 barrels to 21,000 barrels daily to the border refining center, and is due to be enlarged by looping as Pasotex is supplementing its pipe line shipments by tank car movement of crude from Wickett, Texas, at rate of 2700 barrels daily.

The Yates-Wink carrier will be operated for the time being with a single booster station in the Yates field. Three storage tanks, providing 105,000 barrels of room, were erected at the Yates station, and a gathering system that was installed by Morrison Bros. connects to all of Standard Oil Company of Texas' properties. Additional oil will be obtained from the nearby White and Baker and Walker shallow fields through Helmerich & Payne, Inc.'s gathering lines, which handle about 1100 barrels daily. Pasotex will also serve controlled connections in the South Ward district, Ward County, and handle the gasoline and butane output of two natural gasoline plants in the latter area.

Premier Sending Surplus Crude Out to Michigan

Premier Oil Refining Company has started delivery of 100,000 barrels of East Texas field crude to Aurora Gasoline Company, operator of refineries at Detroit and Elsie, Mich., at its posted price of $1.80 per barrel plus 5 cents per barrel for gathering. Deliveries are to be completed May 1, and the oil will be routed through major company trunk lines to Bayshore, Ohio.

Aurora also will purchase a substantial volume of gasoline during this period from Premier's Texas refineries for delivery via tank cars to its Michigan bulk stations. Premier advanced its posted price in the East Texas field 10 cents effective January 10 to offset premium offers of other buyers. This raise has enabled the company to procure a surplus of crude for its local refinery requirements. The higher posting has not been met by other purchasers.

Continued Shortages of Steel Products Forecast

Continuance through 1947 of present shortages of steel products, copper, tin and aluminum was forecast at February's end by the Office of Temporary Controls.

OTC predicted the wage rates will rise somewhat in the spring; there will be an increase in building activity and output of consumer durable goods for at least a good part of the year, and the present high level of expenditures for plant and equipment will continue for at least six months.

Present outlook is for a total steel supply of at least 61 million tons, 18 percent more than in 1946, but demand for steel to maintain a general maximum end-product production will exceed supply by three or four million tons and unbalanced inventories of steel and components will continue well into the year.

Empire One of Owners

Empire Pipeline Company, a Cities Service Company subsidiary, will share ownership with The Texas Pipe Line Company and Shell Pipe Line Corporation in the projected 500-mile crude oil line from the Permian Basin of Texas and New Mexico to Oklahoma. (THE OIL WEEKLY, February 24.) Of the new line, The Texas Pipe Line Company will own 53 percent, Shell Pipe Line Corporation 33⅓ percent and Empire Pipeline Company 13⅔ percent.

Route of the 20, 22, and 24-inch line extends 500 miles from Jal, N. M., via Midland, Westbrook and Wichita Falls, Texas, to Cushing, Okla. It will have a normal carrying capacity of 150,000 barrels daily.

Big Inch Service Area From Baltimore to New England

Service area of the Big Inch pipe lines, if acquired by Texas Eastern Transmission Corporation, may extend from Baltimore to New England, it is indicated by information filed by the company with the War Assets Administration.

This showed that the company's capital structure is based on the sale of gas in the New York-Philadelphia area, but that lines might be run to Baltimore, the eastern portion of the New York metropolitan area or New England should such action be determined to be economically desirable.

Baltimore would be the logical southern boundary of a natural gas service running along the East Coast, the next city to the south, Washington, already having such service. To supply Baltimore, it was disclosed, a 20-inch line would be necessary from a point near Harrisburg, Pa., at a cost of $3.3 million, with a capacity of 160,000 Mcf daily.

Doss-Robertson Gathering System Planned by Humble

Humble Pipe Line Company is installing a crude gathering system in the Doss and Robertson fields, Gaines County, West Texas, with 6½ miles of 4-inch discharge line to connect with Seminole station on Magnolia Pipe Line Company's system. Eight miles of 4-inch will be utilized in connecting the wells in the two fields.

The Robertson area has 5 wells producing 29 to 33-gravity oil from two pays, while the Doss field yields 29 to 38-gravity oil from 11 wells in two zones. Flush production resulted from recent expansion of the Doss field, and considerable development is projected.

Wyco Products Line

Wyco Pipe Line Company will begin construction early this summer on a 271-mile 8-inch products pipe line from refineries in the Casper, Wyo., area via Cheyenne to Denver. Completion is scheduled by the end of the year.

Recently the Wyoming Public Service Commission authorized the company to build the line. Stanolind Pipe Line Company is acting as agent for Wyco in supervising construction.

The new products line will deliver gasoline and distillate fuels to the Denver terminal and a three-mile 6-inch extension from the main line will make deliveries to the Cheyenne terminal.

Detroit Plea Denied

FPC last week denied a motion to involve Phillips Petroleum Company in proceedings connected with Michigan-Wisconsin Pipe Line Company's proposed natural gas pipe line from the Southwest to Wisconsin. Phillips is to supply the gas and Detroit municipal authorities sought to have FPC require the company to apply for a certificate for construction of necessary facilities and to disclose the extent of its gas reserves.

Oil Demand Showing Every Sign of

Standard of New Jersey economist thinks U. S. Refineries will run full blast this year—Crude stocks need building promptly — Sees foreign oil no menace to market

By RAY L. DUDLEY
Publisher, The Oil Weekly

ACTION of the Texas Railroad Commission in upping Texas allowables still another 100,000 barrels a day was timely —and went a long way toward curing a serious situation.

Howard W. Page, head of the coordination and economics department of Standard Oil Company (New Jersey), said last week during a discussion with me in which he made several statements of great interest to the oil industry generally. The discussion, arranged by officials of the company, began the week before and was reviewed February 17, following the action of the Texas regulatory body.

Here are the points brought out by Page:

1) Demand shows every sign of exceeding forecasts made a short time ago. Indications are that the maximum refining capacity east of the Rockies will be called into play this year.

2) Working stocks of crude oil are dangerously low and unless increased, efficient use of refinery capacity will be impossible.

Don't Count on Imports

3) Imports of foreign oil cannot fill the gap. There is little likelihood of any substantial increase in foreign oil imports this year—or next—because demand for such oil outside the U. S. is so great that even present foreign production is inadequate.

4) Standard Oil Company (New Jersey), despite recent heavy crude oil acquirements in the Middle East, will need all that oil, when it begins to flow through new pipe lines, to take care of its Eastern Hemisphere needs. Other companies indicate that there seems to be no likelihood that Middle Eastern oil from other interests will be available for the U. S. under two years, if then.

U. S. Output at MER

5) U. S. production, practically at the maximum efficiency rate of every area where pipe line outlets permit, will be necessary to fill the domestic demand.

On the question of demand, Page referred to January, 1947, refinery runs and apparently was inclined to discount the belief of some sales departments that they could see an increase of as much as 9 percent in demand for refined products in 1947 over 1946. He did emphasize that even the increases in demand forecast last fall, call for a crude oil production and stock situation which up to last week have been met.

Page figures that possible active U. S. refining capacity at 4,900,000 barrels per day. The peak volume charged to refinery stills reached during the war was 5,001,000 barrels per day for a 4-week period July, 1945, but since that time there has been an actual reduction in runs. In the figures he gave, California refined in July, 1945, at the rate of 928,000 barrels per day. Now California is running at 813,000, a 115,000-barrel per day drop occasioned by stoppage of tank car shipments from Texas to California, reduction in Elk Hills Naval Reserve production, as well as a slackened demand from the Pacific. Page does not believe California crude or refined oil will move to Eastern markets, hence the area east of the Rockies is the critical area. Taking the war peak figures (July, 1945), the refinery runs east of the Rockies were 4,073,000 barrels per day according to Bureau of Mines figures. However in September, 1946, runs were 4,096,000 barrels per day east of the Rockies—more than the war-time peak! And during the four weeks ended January 11, 1947, (mid-winter) runs east of the Rockies averaged 4,064,000 barrels per day—5.6 percent more than the runs for the corresponding time the year before and within 26,000 barrels of the 4,090,000 barrels per day output which he says is 100 percent capacity east of the Rockies.

In other words, Page says that demand east of the Rockies this year will be equal to the maximum active refining capacity of the area. This maximum capacity cannot be achieved unless working stocks of crude oil are higher than they are now, he asserts.

Stocks Down, Demand Up

As to stocks, Page pointed out that on February 8, the Bureau of Mines figures showed, east of the Rockies, and excluding West Texas where pipe line capacity to move oil out to refining centers limits the availability of the oil, 148.8 million barrels in storage. In August, 1945, stocks in the same area were 156.6 million barrels, considered a working minimum by the industry committee of Petroleum Administration for War. On October 31, 1939, following a shutdown in the Mid-Continent which had seriously interfered with refining runs, stocks in the area in question were 165 million barrels.

Present stocks, he emphasized, are

Is Crude Price Increase Imminent?

THE domestic and world-wide picture presented on this page normally would point to an increase in the price of crude oil, and we cannot see anything at this time which would warrant the feeling that there are at this time offsetting factors.

Therefore, unless there comes soon a national recession of sufficient magnitude to affect the oil industry, it seems inevitable that crude oil prices will increase—and that before long.

As to the recession, we find a greatly divided opinion. One economist, whose reasoning ordinarily is sound, has the belief that present production of manufactured goods generally is so high that present production levels cannot continue. He says that present production of such goods is not going simply to current demand but to restoration of stocks and that when stocks have been replenished prices will drop. They are entirely too high now, he thinks, to stimulate a continuance of buying. "Somewhere toward the end of the first quarter prices will begin to sag—in fact, some prices are sagging now," he says. "The next quarter will increase the sag." He does not refer to it as a "depression" but rather as an adjustment. On the other hand, there are many who disagree—who point out that there is still a backlog of funds in the hands of those who need things they have been denied for some time, and that on most items there is still a substantial shortage.

When asked if he thought that the "adjustment" would mean lowering the wage scale (his greatest emphasis had been that prices of "things" are too high) our friend said that an increased productivity per hour on the part of the worker could stave off wage reductions . . . "prices must go down, and that means that costs must go down," he said.

So—you can pay your money and take your choice. But with the oil situation as it is, and bearing in mind that oil consumption was less affected by the Great Depression than almost any other commodity, it doesn't seem to us that prospects for a "re-adjustment" will prevent an increase in the price of crude oil from occurring.

Exceeding Recent Forecasts

about 8 million barrels lower than August, 1945, with demand up.

"Unless there is an increase in stocks, refinery runs cannot be maintained at the levels which must be maintained to satisfy the public from a consumption standpoint," he said.

"This means that production had to be increased. And Texas is the only state where production can be substantially increased without exceeding the maximum efficiency rate.

West Texas Future Factor

"Additional pipe line capacity planned or under construction to West Texas should increase runs from that area by 200,000 barrels per day, but that is in the future, and we feel that Texas production should be increased immediately by at least 100,000 barrels per day.

"I know that there are some who disagree but if we take demand figures they have made and their recommendations as to production, etc., we would have a drop in production which would be little short of ruinous. It is true that refined oil stocks are higher than at this time last year, but who would want to be in the shape the industry was in last year?

"West Texas crude stocks have shown an increase but only because movements from West Texas are still limited, as I have observed, by pipe line outlets.

"It is my opinion that crude oil stocks should be increased by more than 10 million barrels as rapidly as possible."

Imports from South America or other places, in Page's opinion, cannot fill the gap even though it may be possible to increase crude oil imports some—with possibly 265,000 to 275,000 barrels a day total average for the year, 35,000 barrels a day up over 1946. Production abroad is going up, but requirements for that oil abroad are going up too, he pointed out.

"There will be an increase in production in Venezuela this year, it is true, but requirements outside the U. S. will consume it," Page declared.

Page said that even when the Iraq line capacity is increased, even when the Anglo-Iranian line from Iran to the Mediterranean is finished, probably in 1949, and even when the Trans-Arabian line is completed in about two years, Standard Oil Company (New Jersey) whose oil production or purchases in the Middle East will have increased tremendously, will need all of that oil for Eastern Hemisphere markets. In fact, figures developed by the company indicate that pipe line movements now projected out of the Middle East will still not take care of the company's Eastern Hemisphere market. (Of course pipe line outlets from the Middle East can be increased and probably will be. That is our own observation.)

Opinion that Middle East oil will not disrupt South American production, and that by 1950 the demand for Venezuelan crude will be more than it now is was expressed by Page.

"It is anticipated that Venezuelan production will be built steadily up to 1.4 millions barrels a day by 1950 (it is now about 1.1 million) and that as long as it can be produced, the demand will take care of that much oil," he continued.

Page figures that the U. S. will export this year an average of 434,000 barrels a day, an increase of about 19,000 barrels a day over 1946. (In 1946 exports exceeded imports by 41,000 barrels a day.)

Production Increases

Page believes that most careful analysis of maximum efficiency rates should be made by state regulatory bodies, and where the oil can be moved, such bodies be prepared to authorize increases in allowable in accordance with the MER. At this time, he said, he thought that the new allowables would suffice.

"I understand that many independent refiners have not been getting the crude actually needed," he said. "It was essential to the welfare of the industry as a whole that these plants be allowed to take their full part in meeting the demand.

"If production is held below the maximum efficiency rate, resulting in failure of the industry to meet the demand, it could have unpleasant repercussions for the industry as a whole.

"That is why I think that we should be sure on what the MER actually is, then be prepared to supply the demand without waste."

Refined Storage Needed

Page also has expressed to his company the belief of his division that additional refined oil storage should be built —and judging from a report made by him to a superior, which I saw, present U. S. refining capacity is too low in his opinion.

All the foregoing adds up to a most interesting situation. The forecasters—all of them with whom we are acquainted—badly underestimated the domestic and the foreign postwar demand. They did not take fully into account the desire of the American public to travel, or rather, they figured on more cars being junked. Actually it would seem that advance figures on the cars to be junked were far too high. Every car which can run is running; an old car uses more gasoline and oil than a new one per mile and lots of cars ran lots of miles in 1946 and are still doing it.

Abroad, depleted stocks had to be built up. Actual consumption abroad, too, seems to be up. The international coal situation is the big factor in this.

Why International Demand Increase?

THERE isn't any question of the fact that foreign consumption of oil is now running at a rate higher than was contemplated before the war ended, and that international-minded oil companies expect it to increase.

Reasons for the demand are simple:

1) Stocks, depleted by the war, had to be built up. This accounted for the demand which started immediately after the war was ended.

2) The big factor is to be found in the international coal situation. In Italy, for instance, where annual demand is 12 million tons, coal costs $25 per ton. Oil, for burning and heating, can be laid down on a basis equivalent to coal at $9 per ton.

In France, where coal production is higher than prewar, but still inadequate, it is reported that a third of the miners are German war prisoners, a third displaced Poles and a third Frenchmen. When this situation is changed, as it will be shortly, there won't be enough men to mine the coal unless a lot of Frenchmen change their minds.

Harvey S. Mudd, former AIME president and a man internationally informed, writing in Mining and Metallurgical Journal, says that recently in England a well informed coal merchant told him the cost of coal in England at one large field was $6 per ton, to which had to be added $4 more for transportation and profit. As a result England is exporting little or no coal, and English factories and railroads are going to fuel oil.

"As a matter of fact," one informant said to THE OIL WEEKLY, "oil is in a most favorable position in competing with coal everywhere in Europe except in the Ruhr."

Is this a temporary condition which may change? Most people with whom we talked think not. They say that there is an increasing disposition of workers against going underground to mine coal. But what will become of these workers unless they do go back to mining?

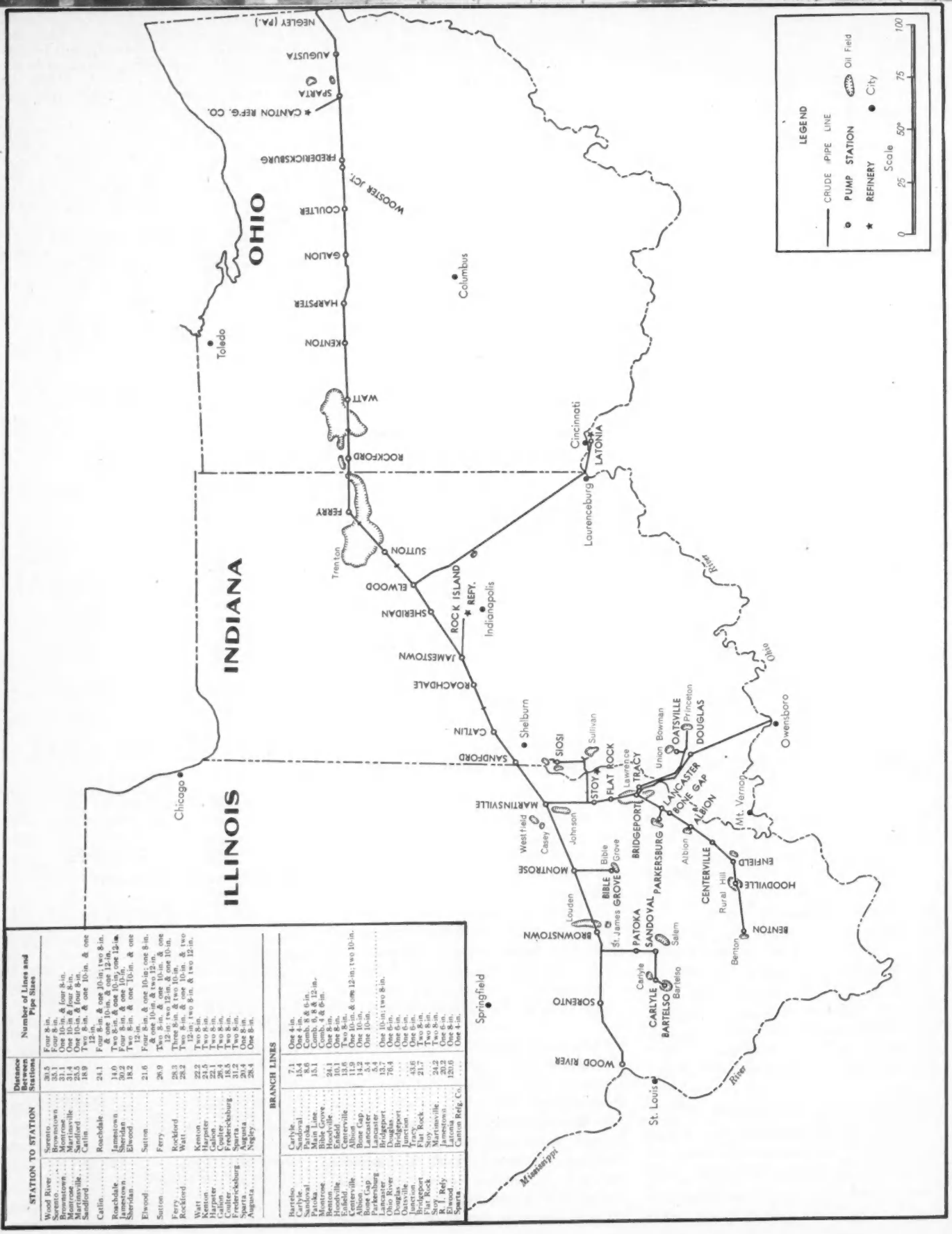
U. S. Navy Group Seeks Industry Cooperation

Members of the industrial mobilization committee of the Navy Industrial Association will meet with Richard R. Deupree, chairman of the Army-Navy Munitions Board, March 25 to discuss military procurement problems which industry can cooperate in solving.

The committee, only recently set up, held its first meeting with Deupree and the other members of the joint board in January, at which the board's plans for 1947 were outlined.

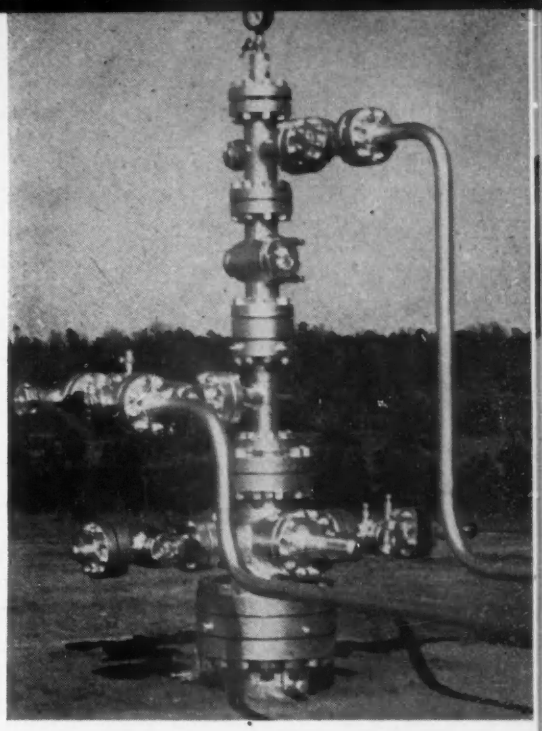
Membership on the committee represents nearly a score of industries which supply vital materials to the military services. The petroleum industry is represented through E. E. Puryear, assistant to the chairman of the board of The Texas Company, and the rubber industry through James J. Newman, vice president of the B. F. Goodrich Company.

The Ohio Oil Company



STATION TO STATION		Distance Between Stations	Number of Lines and Pipe Sizes
Wood River	Sorento	30.5	Four 8-in.
Sorento	Brownstown	35.1	Four 8-in.
Brownstown	Montrose	33.1	One 10-in. & four 8-in.
Montrose	Martinsville	31.4	One 10-in. & four 8-in.
Martinsville	Sandford	35.5	One 10-in. & four 8-in.
Sandford	Catlin	18.9	Two 8-in. & one 10-in. & one 12-in.
Catlin	Roachdale	24.1	Four 8-in. & one 10-in.; two 8-in. & one 10-in. & one 12-in.
Roachdale	Jamestown	14.0	Two 8-in. & one 10-in. & one 12-in.
Jamestown	Sheridan	30.2	Four 8-in. & one 10-in.
Sheridan	Elwood	18.2	Two 8-in. & one 10-in. & one 12-in.
Elwood	Sutton	21.6	Four 8-in. & one 10-in.; one 8-in. & one 10-in. & two 12-in.
Sutton	Ferry	26.9	Two 8-in. & one 10-in. & one 12-in. two 12-in. & one 10-in.
Ferry	Rockford	28.3	Three 8-in. & two 10-in. & two 12-in.; two 8-in. & two 12-in.
Rockford	Watt	28.2	
Watt	Kenton	22.2	Two 8-in.
Kenton	Harpster	24.5	Two 8-in.
Harpster	Galion	28.1	Two 8-in.
Galion	Coulter	28.4	Two 8-in.
Coulter	Fredericksburg	18.5	Two 8-in.
Fredericksburg	Sparta	31.2	Two 8-in.
Sparta	Augusta	20.4	One 8-in.
Augusta	Negley	28.4	One 8-in.
BRANCH LINES			
Bartelso	Carlyle	7.1	One 4-in.
Carlyle	Sorento	15.4	One 4-in.
Sandoval	Patoka	8.0	Comb. 8 & 6-in.
Patoka	Main Line	15.1	Comb. 8, 8 & 12-in.
Montrose	Bible Grove		Comb. 4 & 6-in.
Bible Grove	Bridgeport	24.1	One 8-in.
Headville	Enfield	10.1	One 8-in.
Enfield	Centerville	13.6	Two 8-in.
Centerville	Albion	11.9	One 10-in. & one 12-in.; two 10-in.
Albion	Bone Gap	14.2	One 10-in.
Bone Gap	Lancaster	6.4	One 10-in.
Parkersburg	Lancaster	6.4	
Lancaster	Bridgeport	13.7	One 10-in.; two 8-in.
Ohio River	Douglas	78.4	One 6-in.
Douglas	Bridgeport		One 6-in.
Oatsville	Junction	24.1	One 6-in.
Junction	Tracy	43.6	One 6-in.
Bridgeport	Flat Rock	21.7	Two 8-in.
Flat Rock	Stoy		Two 8-in.
Stoy	Martinsville	24.2	Two 8-in.
R. T. Rely	Jamestown	20.2	One 6-in.
Elwood	Latonia	120.6	One 8-in.
Sparta	Canton Refg. Co.		One 4-in.

INCREASING Dually Completed Gas Well PRODUCTION By Reducing Flow Area



By PAUL L. SHELTON
and
J. M. CLARK
The Chicago Corporation

EXPANSION and development of the huge Carthage gas field, Panola County, Texas, is progressing steadily in spite of material shortages which have greatly retarded drilling and practically curtailed construction of pipe lines and some of the gasoline plants.

There have been approximately 236 wells completed in one or more of the four pay zones found in the field. The majority are completed either as single or dual producers in the Upper and/or Lower Pettit formations, the more productive pay zones. Since initial withdrawals, the combined cumulative production from these formations has exceeded 100 billion cubic feet of gas with a corresponding condensate production of 1,600,000 barrels. Of 236 wells completed, 83 are single producers and 153 are dual producers. Roughly, these wells represent well over 240,000 acres of proven territory, with the limits of the field not yet clearly defined. During the past few months several dry holes and numerous marginal wells have been drilled in the northwest and southeast sections of the field, indicating that the general trend of the more productive or proven section of the field lies in a northeast-southwest direction.

On some wells in the field unusually high open-flow potentials have been reported. Recently, an open-flow capacity of 700,000 Mcf daily was reported on a well in the south section of the field. The tests were later confirmed by the Texas Railroad Commission and the well is reputed to be the largest gas producer in the world. There are numerous wells in the field with potentials of 100,000 Mcf/D or better, but the majority of the wells have potentials probably averaging around 40,000 to 50,000 Mcf/D with a corresponding surface pressure of 2600 to 2700 pounds per square inch. With such a high field average potential, it would appear that most wells in the field were excellent producers and there should be no problem of marginal well production, but as the field gradually expanded, an increasing number of weak wells was encountered, especially in the Upper Pettit formation. The Lower Pettit in the same section often produced a good well capable of sustained delivery of large volumes of gas at high flowing pressures. A dual well of this type became a packer problem as soon as it started producing. The differential between flowing pressures caused a constant upward force to be exerted against the packer, tending to unseat it.

High line pressure normally carried on the gathering system offered a partial solution to the packer problem inasmuch as pressure at the well head could be reduced only until it equalled the back pressure. But as back pressure of the line was increased, daily production of the upper section was decreased to a very low rate of flow. On these low rates of flow, liquid would load up in the annular space until the hydrostatic pressure gradually decreased the flowing pressure to a point where it equalled line pressure and the well would float on the line without producing.

After a few days, formation pressure would eventually build up sufficiently to lift the entire column of liquid from the annular space and into the gathering lines, which contributed to some of the large slugs of liquid flowing into the plant.

Such unstable flowing conditions made it difficult to regulate daily production from the field and the overall efficiency of the plant was seriously affected by the unexpected slugs of liquids. In fact, a special surge tank had to be constructed at one of the plants where wet gas entered to minimize such intermittent overloading and facilitate a more uniform control of liquid surges. In addition to producing liquid heads into the line periodically, low rates of flow are accompanied by low temperatures and pressures which tend to promote conditions ideal for the formation of hydrates and subsequent freezing. The problem of frozen gathering lines can often be traced to one or more of the weaker wells on the system where the gas velocity at the well head, flowing against a relatively high back pressure, is not sufficient to sweep liquids from the line; hence, condensate, and especially water, will drop out in low spots or restrictions and freezing will generally occur as soon as the weather turns slightly cold. At present, gas-fired heaters are being used in the field near some wells, but have not been very successful. In order to keep the lines from freezing as a result of the cool low velocity gas, it would probably require several heaters, spaced at frequent intervals along the line. The cost of such equipment would be excessive.

Although part of the freezing and line surging was attributed to these weak wells, they were only recurring conditions which primarily affected the efficiency of operations and were considered to be of minor importance as compared with the perplexing problem of obtaining maximum daily production of these deficient wells flowing through the annular space.

Production records show that the total amount of gas produced from some of the weaker wells varied from 5000 to 10,000 Mcf for the entire month, whereas the corresponding monthly allowable, as prorated by the Railroad Commission on bottom hole pressure and acreage, was approximately 50,000 Mcf. This left a monthly underproduction of 40,000 Mcf, which in most cases could not be produced or accumulated under the existing conditions because the wells were usually flowed at their capacity continuously. During seasonal demands when production was at peak load, these wells contributed only a small percentage of the total volume required to fulfill contract obligations.

From an economic viewpoint, such

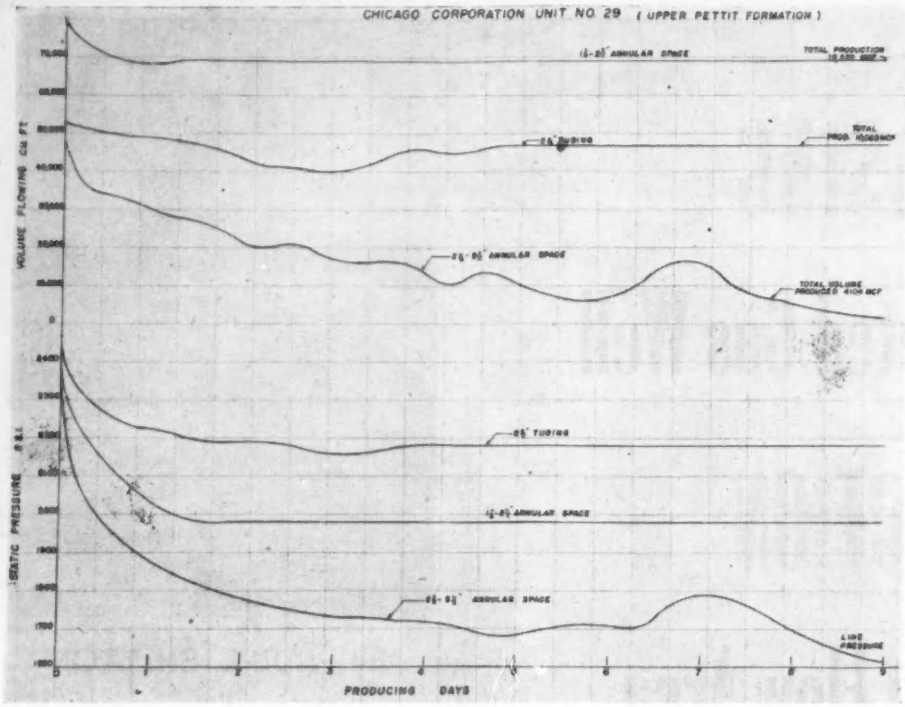


Figure 1. Relation between flowing pressures and daily volume produced over nine-day period to determine characteristics of well under experimentation.

wells prolong the eventual payout of the initial investment of the operator. In addition to the operator's loss of production, royalty payments to individual owners included in the unit were reduced accordingly. Since spacing regulations in this field definitely establish one well to every 640 acres, it became apparent to both operator and owner that a good producer in each pay zone was essential in order to realize profitable returns.

A solution of the various problems of a weak producer in the upper section of a dually completed gas well became more urgent as this type of well became more prevalent. Approaching the problem primarily from the standpoint of increasing the daily production of these deficient wells, tests were conducted over a period of time to determine the best method of continuously unloading liquid from the well bore so that flowing pressures would not be materially affected by hydrostatic pressure. It was logical to assume that in order to prevent liquid from accumulating in the annular space, the velocity of the flowing gas would have to be increased considerably to furnish energy required to lift the continuous flow of liquids into the well bore at a uniform rate. To increase velocity, it was necessary to decrease effective flow area. This was accomplished very easily by simply pulling the side door choke which separated the two producing pay zones and setting a special separation tool in the landing nipple, as described in the following experiments.

Initial Tests

The test well selected for this particular experiment was Chicago Corporation Unit 29, representative of the type of well previously discussed as having a weak upper section and a comparatively strong lower section. Prior to the initial tests, the well was shut in for a week to permit the formation to build up to its maximum pressure so that a complete cycle of production could be noted. Daily production records of the Upper Pettit well, while flowing through the annular space, were carefully compiled and the results tabulated in the form of a production curve (Figure 1) showing the relation between flowing pressures and daily volume produced. These records were continued for a period of nine days, after which the accumulation of liquid in the well bore finally reduced the flowing pressure to the same pressure as that carried on the gathering system and the well stopped producing. (Figure 1.) During this period, the well produced approximately 4000 Mcf of gas at an average pressure of 1700 psi.

Past production records showed that this well usually loaded up and floated on the line after five to seven days production, but while this test was being conducted, the line pressure was lowered unexpectedly. This allowed the well to partially unload some of the liquid, thereby enabling it to produce an additional three days. (See pressure curve for 5th producing day.) The well was again shut in for a few days to allow the formation pressure to build up. The side door choke was pulled and a separation tool run in on a wire line and set in the regular landing nipple. Although this tool is comparatively new, it has already proven successful and can be used in many operations in the field, either in well completions or in special tests. This specially constructed tool (Figure 2) was designed with two sets of opposing cups which tend to give positive seals against pressure above and below the tool. The separation tool was landed in the nipple and the cups were positioned immediately below the landing ports. This completely sealed off the lower section of the well.

Due to the construction of the tool, the upper section of the dual well could produce through the ½-inch ports in the landing nipple and into the tubing string, as shown by the arrows in Figure 2.

The well was turned on and produced for the same period of time (nine days) as used on the annulus production test so a comparison of producing characteristics through annulus and tubing could be evaluated over a complete cycle of production. The daily production records for this same well (Upper Pettit formation), while flowing through the tubing, indicated a constant flowing pressure around 2200 psi and the total volume passed for nine days' production was 10,000 Mcf. This represented an increase of 500 psi in flowing pressure and 6000 Mcf greater flow than in the annular space production. It is of particular interest that the same well producing through tubing instead of annular space not only increased production nearly 150 percent as compared with the annulus production, but at the same time increased the flowing pressure 500 psi, enabling the well to maintain stabilized flowing conditions against a relatively high line pressure. Since the test was conducted over a nine-day period with surface conditions remaining fairly equal, it is estimated that much larger volumes of gas could have been produced, as the flowing pressure was still much greater than line pressure. Conversely, production in the annular space ceased as soon as the flowing pressure equalled line pressure.

The well on which these tests were conducted to determine the relation between effective area, velocity, and production was completed with 5½x17-pound casing and 2½-inch upset tubing. On this pipe combination, effective flow area of the annular space was approximately ten square inches as compared with the effective flow area of the 2½-inch tubing which was 4.87 square inches. By flowing the upper section of the well through the tubing instead of the annular space, the area was decreased by one-half. Inasmuch as velocity varies inversely as the square of the diameter, the velocity in this instance was practically doubled and the lifting power or available energy was increased accordingly. Inspection of daily production charts of the upper section flowing through the tubing showed that very small heads of liquid were occurring at regular 15 minute intervals (Chart 2), indicating that although fluid was being removed continuously, the velocity of flow was still not sufficient to suspend fluid in a vapor phase and sweep the lines clean, thus giving a smooth line chart on both differential and static pressure.

As a result of the foregoing experiments on the test well, the problem of increasing daily production of a deficient well in a dual completion was resolved into one of decreasing the effective flow area, which in effect increased the velocity of the flowing gas. At first it was suggested that a cross-over packer would accomplish the desired effect and should be used not only on producing weak wells, but also on all wells on which a similar completion was contemplated. It was pointed out that by using this particular type of packer, the lower section, which was frequently considered a good producer, would maintain a comparatively high flowing pressure, even flowing through the annular space; while the weak upper section of the well would produce through the tubing where a decreased area would insure results comparable to those obtained on the test well using the separation tool. This suggestion, however, was never utilized because of acknowledged disadvantages. To set a cross-over packer in one of the producing wells, it would have been necessary to kill the well and move in

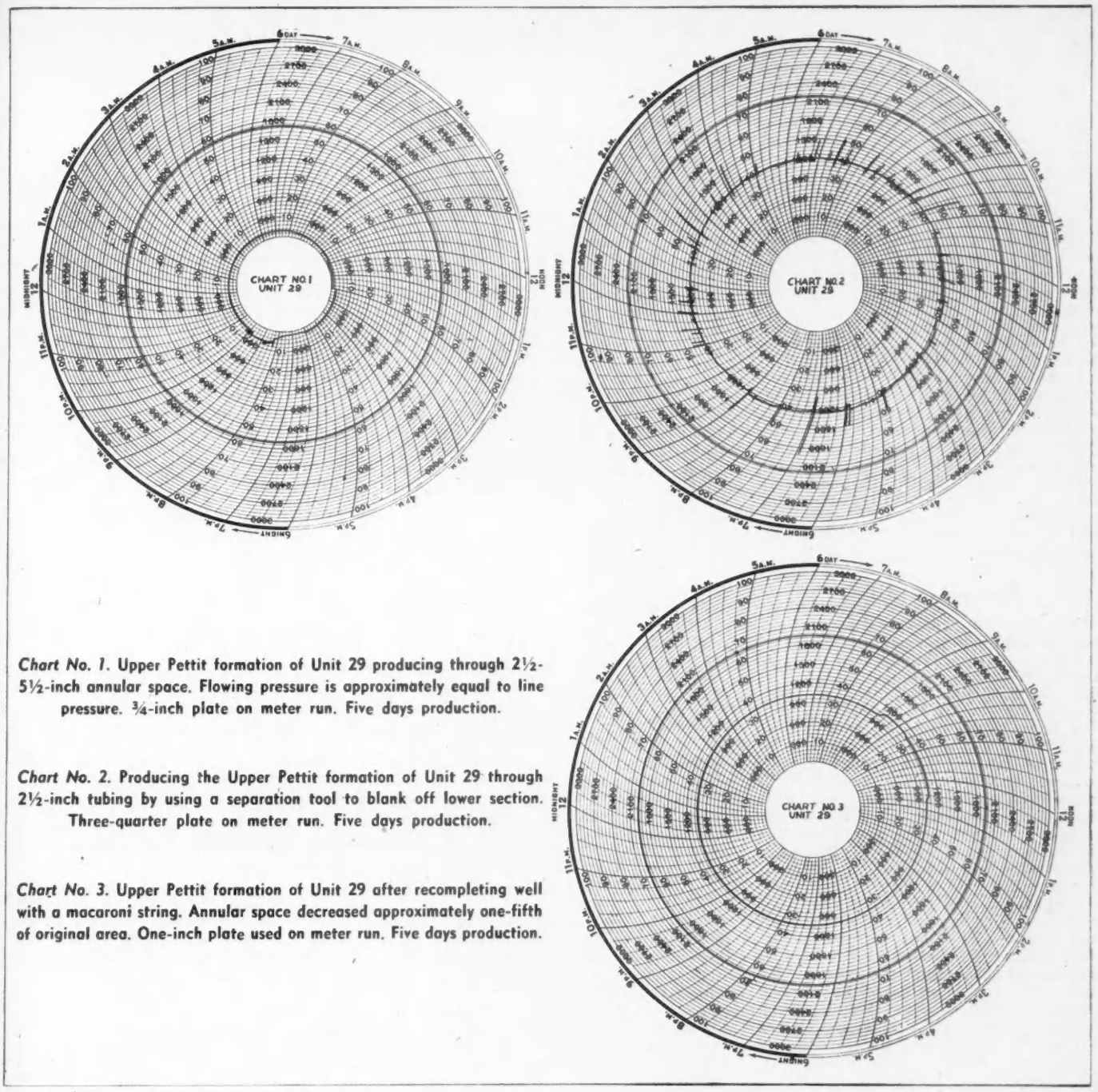


Chart No. 1. **Upper Pettit formation of Unit 29 producing through 2½-5½-inch annular space. Flowing pressure is approximately equal to line pressure. ¾-inch plate on meter run. Five days production.**

Chart No. 2. **Producing the Upper Pettit formation of Unit 29 through 2½-inch tubing by using a separation tool to blank off lower section. Three-quarter plate on meter run. Five days production.**

Chart No. 3. **Upper Pettit formation of Unit 29 after recompleting well with a macaroni string. Annular space decreased approximately one-fifth of original area. One-inch plate used on meter run. Five days production.**

a workover rig. This would involve considerable expense and loss of production. Also, there existed a good possibility of mudding off the weak section completely and decreasing the potential or deliverability of the lower section during workover operations. A cross-over packer in later completions was also ruled out due to the results of pressure surveys which showed a gradual decline in bottom hole pressure signifying that the lower section was not as strong as initial potentials indicated; hence, a decrease in flowing pressures could be anticipated in the near future. In addition, some of the lower Pettit wells were no stronger than those of the upper Pettit.

After considerable study, a method was devised which not only decreased the effective flow area of the upper section, but also reduced the area through which the lower section was to produce, insuring both sections a high flowing velocity. Briefly, this method consisted of snubbing a macaroni string (1¼-inch tubing) inside the 2½-inch tubing under pressure with special equipment. After completion, the lower section would flow through the macaroni string and the upper section through the annular space between the macaroni string and the 2½-inch tubing. The results of decreasing the effective flow area in several wells are shown in Table 1.

Table 1

Increasing Dually Completed Gas Well Production by Reducing Flow Areas

Upper Pettit Unit No.	Max. Daily Prod. Prior to Workover Against B. P. of 1600 psig	Max. Daily Prod. After Workover Against B. P. of 1600 psig
11	1000—1200 MCF	2500—3000 MCF
29	400 MCF	1750 MCF
31	100 MCF	1000 MCF
25	125 MCF	2500 MCF

Initial production figures based on a back pressure of 1600 psig, stabilized flowing pressure, which show the approximate amount of net gain each well has realized from the workover.

Special tools and well head equipment had to be designed which could be adapted to the existing Christmas tree and tubing string in order to recomplete the well in such a manner as to utilize the available material with minimum expense, and at the same time perform snubbing operations satisfactorily. One of the first problems encountered was the selection of a suitable macaroni string which had a cross-sectional area large enough to permit a daily flow of at least 2000 Mcf without an appreciable drop in flowing pressure due to friction. Calculations for the friction values, based on a modified Weymouth's formula, showed that the area of 1¼-inch tubing would pass the required volume with sufficient velocity to keep fluid unloaded from the well bore. A flush-jointed pipe was desired, but due to scarcity of pipe, especially in small diameter, pipe available at the time was only 1¼-inch upset

tubing. The outside diameter of the coupling on this tubing was 2.20 inches, the inside diameter of the 2½-inch tubing in the well to be reworked, 2.44 inches. It was obvious that such a restriction in the annular space would increase friction values considerably, so it was decided to have a machine shop rework the tubing and, if possible, eliminate couplings and make the joints a flush fit. It was found that the area of metal in the tubing and the length of upset was not sufficient to cut regular threads, so a special tapered thread was designed using the upset section of the tubing for the box end and the non-upset section for the pin end. The pin end was tapered 1¼ inches per foot with 16 threads per inch and when stabbed into its mating box and made up securely, the combination resembled a flush joint with the exception of a small lip on the box end. It was doubted whether the fine threads would be practical or strong enough to be leak-tight and support a dead load of 15,000 pounds (6000 feet @ 2.5 pounds per foot), so several joints were subjected to tension tests. The results of these tests removed all doubts and proved that the threads were capable of withstanding a load of 55,000 pounds before shearing.

Construction of Tool

The special tool designed for this operation is probably the most important single unit in the completion of the well. Its function is essentially the same as that of a regular packer in any dual completion: that is, to maintain separation between the two producing formations. Construction is somewhat similar to that of the separation tool, having only two sets of opposing cups; however, this tool has no hold-down slips and is run in the hole on the bottom of the macaroni string. It is positioned in the landing nipple immediately below the ports which allow the upper section to flow through the annular space between tubing and marcaroni string and the lower section to produce through the macaroni string. The two formations are then sealed from each other by differential pressure spreading the cups on the tool against the wall of the landing nipple. While the tubing is being snubbed in, a special closing tool in the bottom of the packoff tool seals off the well pressure and the inside of the macaroni string is at atmospheric pressure. As soon as the packoff tool is seated and all well head controls properly secured, the closing tool is forced out by a slight pressure differential which exceeds that of the lower formation. The closing tool then drops in the tail pipe, thus allowing the lower section to flow through the macaroni string. (Figure 3.)

The tubing hanger selected for supporting the macaroni string and to effect a positive seal between the two producing formations at the well head was a simplified unit commonly referred to as the boll weevil type, which is used in conjunction with a polished joint. This type of hanger was selected because it could be lowered through the blowout preventers under pressure until the stuffing box seated in the tubing head bowl. Also, the polished joint, being the final full joint in the string, is permitted to slide through the stuffing box until the packoff tool on the end of the string is properly seated in the landing nipple. This method tends to offset any errors due to inaccurate pipe measurements.

It was thought that the packoff tool should not be pulled out of the landing nipple once it was seated. Accordingly, the polished joint was cut off and threaded after the tubing was landed. Packoff adjustments are simple and positive, and assure a pressure-tight seal. Two rings of ½-inch hydraulic packing on the outside of the stuffing box form a leakproof seal against the tubing head bowl. These rings are adjusted by alternately tightening four lockscrews with conical-shaped ends against the tapered surface of the hanger housing to force the hanger into the bowl and compress the packing uniformly. A wedge and ring packing is used inside the stuffing box to effect a seal against the polished joint. This is compressed against the pipe by tightening an adjustable nut with a regular gland wrench. For the tubing head, a regular 2½-inch tee with slight modifications was used. Tubing head and hanger were specially constructed to fit the macaroni string.

At the time the first well was to be tubed, these heads and hangers were not available, so a regular 2½-inch cross was reworked to serve as a tubing head. A four-inch recess was machined in the top section to hold ten rings of packing. An adjustable nut held the packing in place securely. A 1½-inch polished rod was used with the packing on the final joint in the string to effect a packoff between producing formations at the well head. The fixed type of packing was used only on the first well and boll weevil or removable type used on all the other wells reworked.

First Well Reworked

The first well to be reworked and completed with a macaroni string inside of 2½-inch tubing was Chicago Corporation's Unit 11, located in the north section of the field. This well was selected for the initial workover because the upper section was a deficient well and had accumulated a large underproduction.

A 60-foot mast was required to clear the height of the Christmas tree plus three blowout preventers and still leave ample room to handle a 30-foot joint of tubing. The tallest portable mast available (45 feet high) was rented and an additional 15-foot section welded on the bottom to give a suitable working height. After strut bracing was added for reinforcement, the mast was raised with a winch truck using a double line arrangement. The base of the mast was spotted about seven feet from the Christmas tree and the top centered in line with the master valve. This placing allowed sufficient clearance for all snubbing operations. When the mast was properly aligned, guy wires were adjusted with turnbuckles. A wooden scaffold about ten feet high was constructed around the tree for the crew to work snubbers and make up tubing.

After the well was disconnected from the meter run and the side door choke pulled, specialized equipment required for the snubbing operation was rigged up, using the mast and a winch line working through a double sheave traveling block. This equipment consisted of three separate and distinct units, each capable of performing one particular phase of the snubbing operation. These units may be classified as follows:

1. Snubbing equipment for forcing the macaroni string into the well against pressure and at all times preventing the pipe from being blown out of the hole.

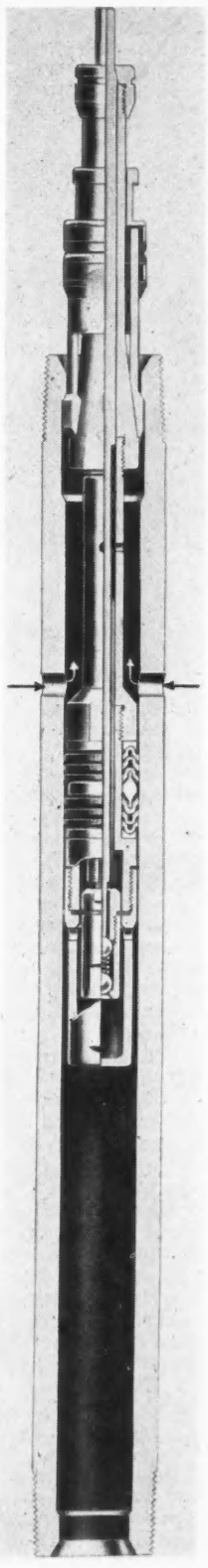
2. Control equipment for maintaining a shutoff between pipe and casing and providing a means for lubricating couplings or any projecting surfaces on the pipe into the well.

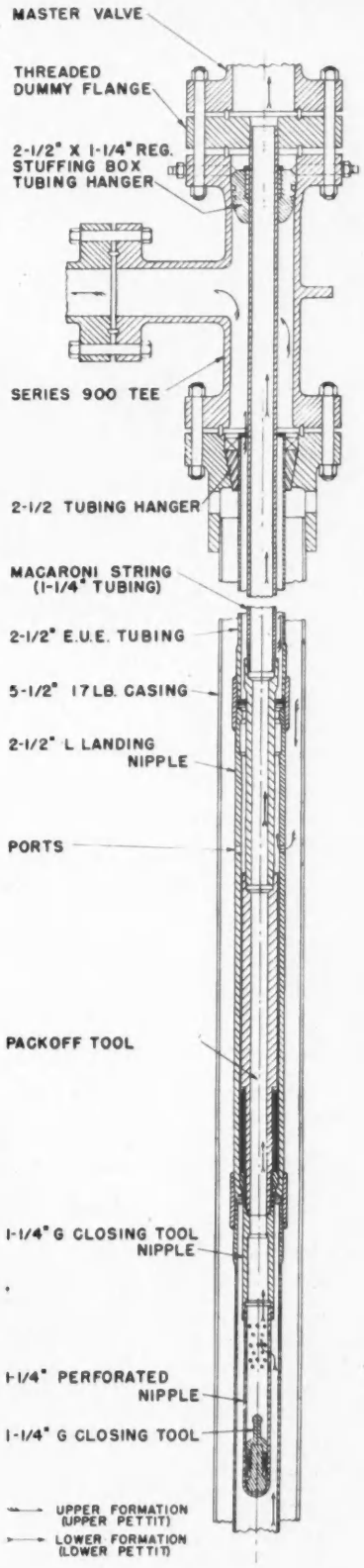
3. Equipment for plugging the first joint in the string so that the inside of the pipe is at atmospheric pressure at all times.

Equipment above the Christmas tree was arranged in the following order: Immediately above the master valve was mounted a regular 2½-inch cross which had been reworked to serve as a tubing head and packoff, as previously discussed. On top of the cross was an adapter with a flange on either end. The hole spacing on one end mated with the bolt circle of the cross and the other end with the flange on the lower blowout preventor or safety control head. Completing the arrangement (Figure 4) are a middle blowout preventer, a three-foot spool, top blowout preventer, stationary snubbers, and traveling snubbers.

Despite the seemingly complex arrangement of equipment, the operation of snubbing pipe in the hole under pressure is relatively simple. To shut off flow around the pipe when it is being run, three specially constructed pressure operated blowout precenters or control heads are used. These control heads, instead of depending on well-head pressure for operating purposes, are operated by fluid pressure from a small power pump some 15 feet from the well. This unit furnishes a constant supply of fluid under a regulated pressure. The control heads are of the quick ram type which require only a few minutes for repacking. The rams are equipped with self-feeding rubber packing faced with a tough hydraulic packing which contacts the pipe, assuring positive shutoff and extended wear.

The lower control head (10, Figure 4) is a safety head, used only in the event it is necessary to change packing in the center, or auxiliary, control head (9). By alternately opening and closing the top control head (8) and auxiliary control head (9), the couplings, or any slight projections, as in the case of this particular macaroni string, are lubricated into the well. The top head controls well pressure until a pipe coupling or joint is ready to be passed through it. At this point, the auxiliary control head is closed and pressure released between these two heads. The top head is then opened, the coupling passed through it, the top head closed, pressures equalized over the auxiliary head, and the auxiliary head again opened. These operations of opening and closing the control heads and equalizing and releasing the pressure between them, are accomplished through the use of three four-way valves which are made up into a pressure-operated control manifold. These operations are easily and quickly performed by manipulating only three levers. To prevent accidentally turning the well loose by opening all heads at once, they are constructed so that either the auxiliary control head or the safety control head must be closed, and the pressure between that head and the top control head released before the top control head can be opened. Similarly, the top control head must be closed, and the pressure between it and the auxiliary control head or safety control head





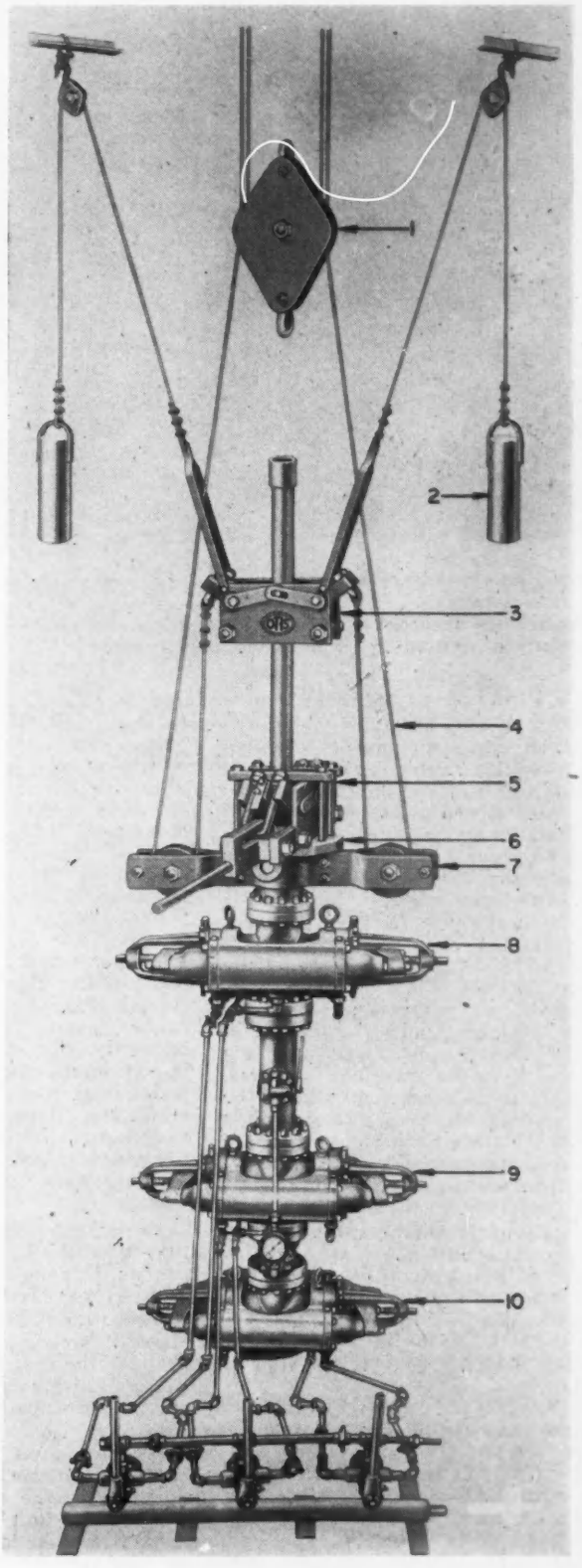
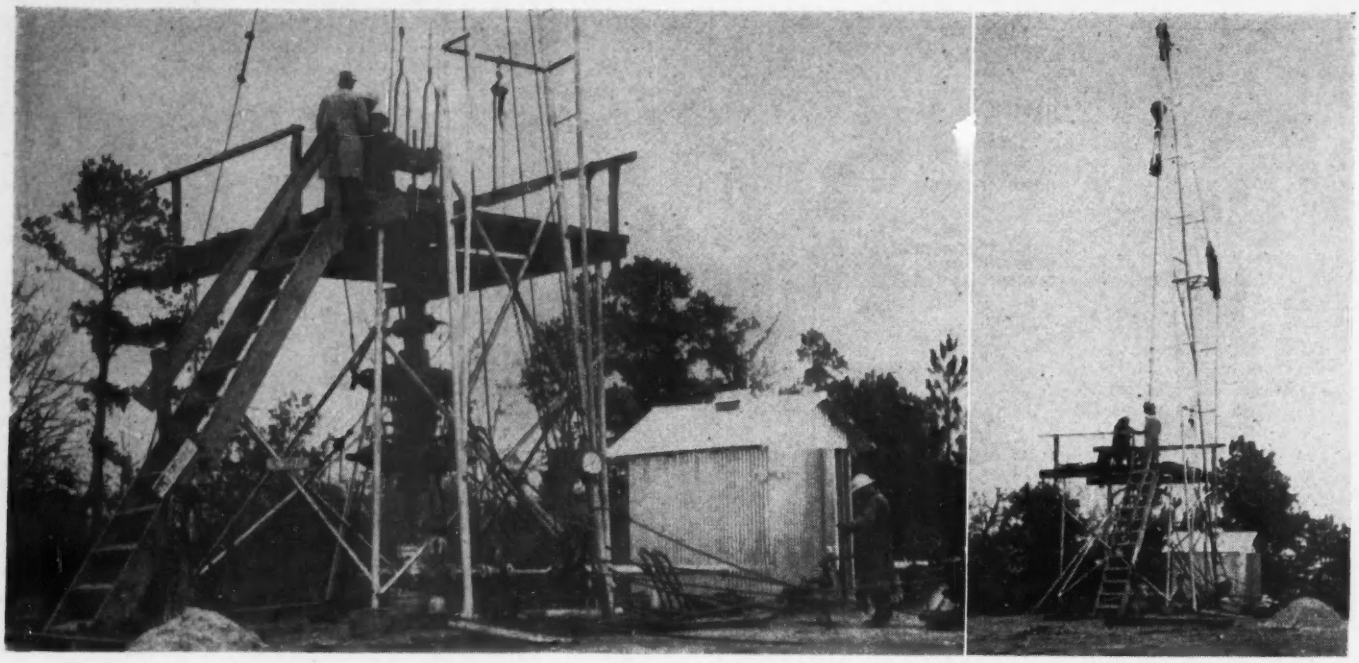


Figure 2 (left). Cut away drawing of type of separation tool run into well to seal off the lower producing section of the well.

Figure 3 (center). Diagram of closing tool and relation to other parts of down-the-well pressure control device used in test runs.

Figure 4 (right). Arrangement of snubbing equipment and surface control units. 1, traveling block; 2, balance weights; 3, traveling snubbers; 4, snubbing line; 5, stationary snubbers; 6, snubbing block; 7, snub block clamp; 8, top control head; 9, auxiliary control head; 10, safety control head.



Left: **Arrangement of control valves and snubbing equipment with working platform set close to stationary snubbers so as to simplify work of running tubing.**

Right: **General view of special mast and working platform for snubbing tubing into well. Mast has been designed to afford clearance over elevated platform required to accommodate control heads.**

equalized, before either auxiliary head or safety head can be opened.

The snubbing equipment consists of a set of traveling snubbers (3, Figure 4) which are used to force the pipe into the well against closed well pressure, and a set of stationary snubbers (5), which are used to prevent the pipe from being blown from the well while the traveling snubbers are being raised or lowered for a new bite on the pipe. Raising the traveling block (1) causes the traveling snubbers to be pulled down, forcing the pipe into the well. The snub line (4), passing over the center sheave of the traveling block and under the sheaves in the snub block clamp (7), transmits a balanced pull to the traveling snubbers. Thus, there is no tendency to bend the pipe by pulling more on one side than the other. Balancing weights (2) are regulated to automatically raise the traveling snubbers for a new bite when pipe is being snubbed into the hole.

The stationary snubbers are heavily bolted to the snub block (6), which is flanged to the top control head. The snubbers are so constructed that once they have taken hold of the pipe, the greater the force trying to blow the pipe out of the hole, the tighter the pipe is gripped.

After equipment was rigged up securely, the packoff tool was made up on an eight-foot pup joint of 1¼-inch tubing and started in the hole against a well head pressure of 2630 psi. This pressure exerted an upward force of 5700 pounds against the tubing, but the snubbing equipment held firm and the first joint was slowly forced down. The second joint added was a full joint of 30 feet so a trial bite of three feet was made with the traveling snubbers and this forced into the well with comparative ease. These small bites were continued until several joints had been forced in safely, then as more joints were added, the bites were gradually increased to four feet and finally six and eight-foot bites were taken after 30 or 40 joints were in the well. It was roughly estimated that about 90 joints would have to be snubbed in before the weight of the tubing string would be equivalent to or greater than the upward force of the well pressure plus the force due to the friction of the pipe sliding through the rams in the control heads. Actually, it required 102 joints to overcome these resistant forces before pipe started in the hole under its own weight and without the aid of snubbing equipment. The remainder of the pipe, 96 joints, was run in fairly rapidly, averaging ten to 12 joints per hour. The only shutdown time recorded for the entire job was due to changing the hydraulic packing on the rubber inserts in the rams. This was primarily due to the packing being in continuous contact with the used pipe, which was rusty and scaly. Although crankcase oil was used freely in an effort to help lubricate the pipe through the control heads, the packing wore out several times, each necessitating a change.

During later operations, it was found that after the joints of tubing had been sanded, to remove the scale, and coated with grease instead of oil, it could be run into the well easier and with a substantial saving in time. Also, a slick joint on the first joint of tubing going in the well and a set of worm rams made starting the string easier and the job safer.

As each joint was snubbed into the well, a close check could be made on the condition of the string in the hole. Since the closing unit in the bottom of the packoff tool kept the inside of the pipe at atmospheric pressure, any leak that occurred could be attributed to the last joint run in, as it would be detected as soon as the outside of the pipe was subjected to well pressure.

When tubing measurements showed the packoff tool to be about four or five feet above the landing nipple, the 1½-inch polished joint was made up in the string and lowered into the well until the weight indicator dropped to zero, signifying that the tool was landed properly and was partially supporting the weight of the string. Well pressure was gradually released from the control heads, allowing the packing to expand and effecting a packoff in the cross. Snubbing equipment, together with control heads, was removed, stripping the well down to the cross or tubing head. The string was then pulled up about a foot from the neutral position and held fast by a set of tubing slips while the pipe was cut off at this point and threaded with a regular pipe thread. Due to slack in the pipe, a one-foot movement was permissible without unseating the packing tool. A dummy flange, threaded on both sides, was used to connect the pipe used as a stabbing joint with the macaroni string. Then the string was again lowered until the dummy flange mated with the top flange of the cross. A new master valve was placed on top of the dummy flange and bolted securely with extra long bolts which ran from the lower flange of the valve through the dummy flange and tightened below the top flange of the cross. The closing tool was then forced out and into the tail pipe by equalizing the pressures at the well head plus a few barrels of water in the macaroni string to overcome bottom hole pressure. As soon as the lower section was opened the water was kicked out and the well came in with a good flowing pressure.

Volume Up

Both sections of the well were put on the line and flowed for two weeks to observe any new producing characteristics of the deficient upper section and to check the friction values of the lower section flowing through the macaroni string. Production records for these two weeks showed the upper section to be definitely improved and capable of maintaining a constant flowing volume of 2500 to 3000 Mcf per day with a stabilized flowing pressure of 1800 psi against a line pressure of 1600 psi. Prior to the workover the best daily production that could be realized against such a high line pressure was about 1200 Mcf.

The experience or "know how" gained

■ CONTINUED ON PAGE 40

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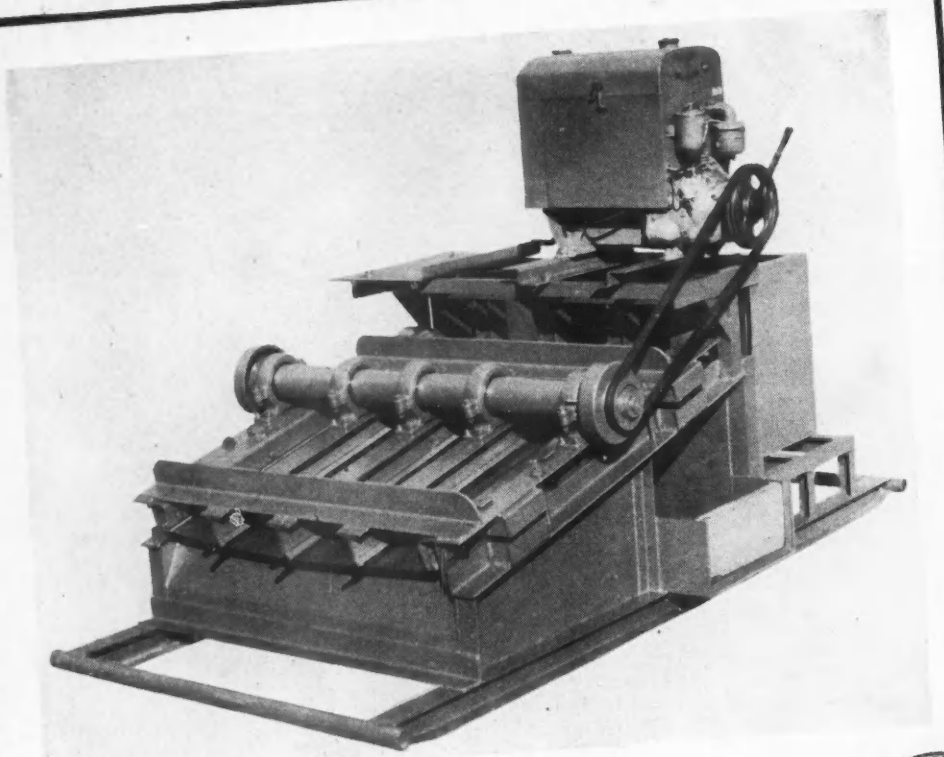

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DRILLABLE BRIDGING PLUG AS Shooting Tamp

By J. D. DUNIGAN and CHARLES B. SNODGRASS
Lane-Wells Company

THE drilling industry has long recognized the need for a safe and economical tamp for shooting wells with nitroglycerin or other explosives. This need has caused many diverse materials to be used in tamping shots where such tamping produces more satisfactory results. Materials such as sand and gravel, quick-set cement and other compounds have been used in loaded holes with varying degrees of success. However, among the disadvantages encountered in the use of such tamping material was the difficulty of proper placing as well as the time and labor consumed in cleaning out following the shot.

In order to answer this need there has been developed a drillable bridging plug which apparently meets specifications of both safety and economy by enabling the operator to set the tamp precisely and quickly and afterwards to drill it out with the minimum of effort and expense.

The drillable bridging plug has been used successfully in the Mid-Continent area and in the Illinois Basin. The plug has been set above nitro shots in open hole (Figure 1) and also has been set above nitroglycerin in both perforated and unperforated pipe sections (Figure 2).

The procedure followed in general has been as follows:

1. To run the desired amount of nitroglycerin with a short-period time bomb.
2. Dump a few feet of sand on the bomb as a safety precaution.
3. Set a drillable plug directly on the sand.
4. Place a few feet of sand, gravel, or cement on the plug and fill the hole completely with fluid.

The drillable bridging plug may be drilled out with cable or rotary tools or with a bit of tubing. The plug is designed to maintain its position in the well until it has been drilled down to the bottom slips. Part of the plug may, however, be knocked out in drilling and fall into the shot hole.

The casing above the shot hole is kept in shape by the plug. When it is drilled out, easy entrance into the shot hole is possible.

In all cases on record where the drillable bridging plug has been used as a tamp in properly cemented casing, the casing was not damaged and the plug was found in place. In one case where the casing was not cemented, the casing was partially collapsed. This was swedged out easily and the bridging plug found in place. The safety of the plug is indicated by these results.

Gun-Perforating Pipe for Shooting

In the Illinois Basin, upper sands have been cased off in many pools originally completed in lower zones such as the McClosky lime and deeper. Due to decline in original production, many companies are now interested in opening some of the upper zones where there is a possibility of increasing production at low cost. In most cases, the testing of the upper zone requires the use of well shooting with nitroglycerin to get the best results.

Several methods have been employed

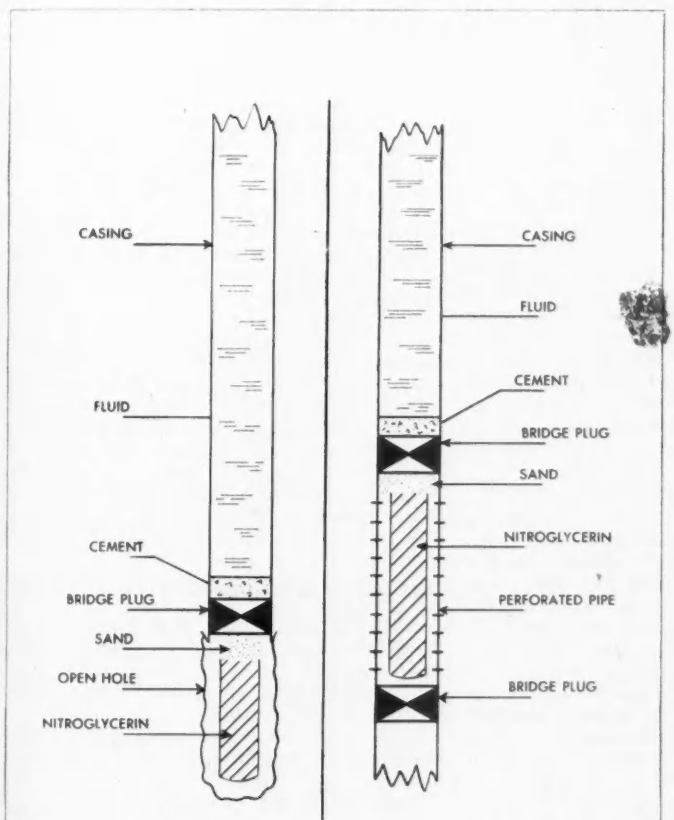


FIGURE 1 FIGURE 2

Drillable bridge plugs used as nitroglycerin tamps.

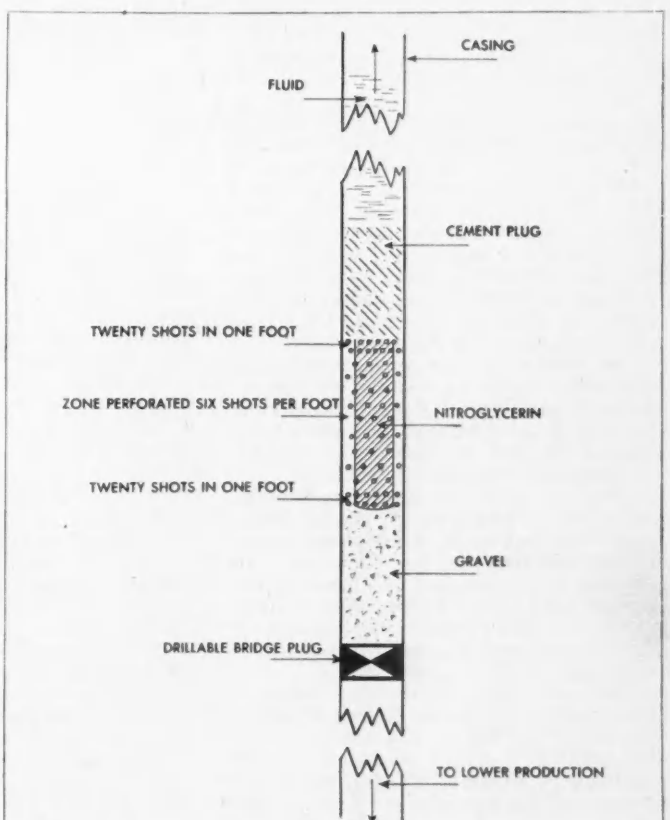


FIGURE 3

Perforating for nitroglycerin shooting.

to open these zones in Illinois—milling out the casing being the most common. A nitro shot is then placed in the window with either a cement plug or a sand pack on top of the shot. This operation takes several days of rig time. Usually the operator furnishes a string of tubing for the milling operation and the wear and tear on the tubing due to milling is an item of expense. The milling of steel casing, considering rig time, wear and tear on tubing and equipment and the cost per foot for milling, makes this method expensive. Various companies are using gun perforating in preparation for nitro shooting. This procedure has proved very successful. It has resulted in saving both time and money and is usually carried out in the following manner:

1. Set a drillable bridging plug 25 to 30 feet below the zone to be opened, plugging off any lower zone that may be producing.

2. Bail or swab the hole dry, down to the plug. Fill the hole, from the top of the plug to the bottom of the zone to be opened, with gravel.

3. Gun-perforate two or three holes in the impervious formation at the bottom of the zone to be tested. This will check cement job and test for water shutoff. Gun-perforate two or three in the upper foot of the zone to test for water shut off at this point. A squeeze job may be performed here, if necessary, without putting direct cement pressures on the saturated zone.

4. Gun-perforate 20 holes in the bottom foot of the pay section, using ten regular bullets and ten hollow point bullets. This ring of heavily concentrated perforations will tend to prevent the nitroglycerin from damaging the casing below the shot section. Gun-perforate the remainder of the section with six holes per foot, using the same ratio of sharp and hollow point bullets. These perforations afford the nitroglycerin a start in all directions, and reduce the possibility of blowing out only one side of the casing. Gun-perforate the top foot with 20 holes just as in the bottom foot.

5. Place nitroglycerin in the perforated section with time bomb.

6. A quick-setting cement, sand or fluid tamp is then placed on the shot. Figure 3 shows the entire program.

Some of the most successful jobs of this type in this area have used all the nitroglycerin that could be run in the casing. The casing is well blown apart by the shot and small particles may be removed with a sand pump.

The task of reentering the casing below the shot section is simplified by the gravel pack above the plug. This gravel may be sand pumped or circulated out without the use of tools. The possibility of damage to the top of the casing from the action of tools is reduced greatly. When the drillable plug is reached, there is casing up to 30 feet in length for the tools to run in.

Some operators are of the opinion that the casing has a tendency to protect the formation from the heat of the nitro blasts.

The entire operation, when no remedial work is necessary, may be completed in a single day. Ordinary cleanout tools may be used for all tasks. The total cost for the entire job is considerably less than for a milling out job of the same magnitude. The results have been very pleasing to the operators.

By running these plugs on gun-perforator units, highly accurate measuring devices are available for precise setting. This permits positioning the tamp in any desired spot with assurance; it also permits work close to the shot. The time required to run a bridging plug is a minor item in a plug-back operation.

These applications of the drillable bridge plug offer interesting possibilities for faster, more economical completions, and plug-back operation. The success to date recommends it.

Dually Completed Gas Well Production

■ CONTINUED FROM PAGE 36

from this workover was invaluable, and when improved and applied to the other workovers in the field, considerable savings in time, labor, and expense were effected. As a result of the problems that confronted the initial workover, better methods of operation were devised which eliminated or minimized these problems.

The next unit to be reworked using the macaroni string inside of the 2½-inch tubing was Chicago Corporation's Unit 29, the test well on which the velocity-production experiments were conducted. Like Unit 11, the upper section of this well had accumulated a large underproduction which could not be produced through the annular space. By failing to produce its monthly allowable, this section was considered a deficient well and classified accordingly. However, previous tests of this same section flowing through the tubing instead of the annular space indicated that it was capable of producing a daily volume of at least 2000 Mcf at stabilized pressures, so actually it was a good well.

After the initial workover, several improvements were made in the method of operation as well as the equipment used in recompleting the dual producer. One of these improvements was the construction of a 63-foot portable mast and substructure which could be rigged up quickly without the aid of heavy equipment.

The mast used for the first workover was heavy and bulky. It was originally designed for heavy loads and could not be suitablly adapted to handle a light tubing string properly. Also, the 15-foot section which was fabricated and welded on the bottom of the mast for additional height unbalanced the weight over the trailer part of the unit making transportation difficult. In view of the disadvantages plus the high rental charges on the mast, it was decided to construct a lighter mast for this type of workover.

Accordingly, a complete unit was constructed consisting of a 63-foot, two legged mast and a demountable substructure. Each upright, or leg, of the mast was made from two joints of 4½-inch drill pipe welded together. These legs were spaced about eight feet apart at the bottom and tapered to three feet at the top, being joined at each end with six-inch pipe. For internal cross bracing and strut bracing, 2½-inch tubing was used for both reinforcement and structural rigidity. On top of the mast was mounted a double sheave for the snub line.

The demountable sub-structure designed for the crew to handle the tubing and work the snubbers consisted of four 12-foot legs of three-inch pipe cross braced with 2½-inch tubing. Three by eight-inch timber sills on top of the leges served to support a two-inch wooden floor. This combination formed asturdy, compact unit which could be assembled in a few minutes by merely bolting the cross members to the legs. When completed, total cost of the mast and substructure was less than the rental charge on the first mast used.

Valve Eliminated

Another improvement in completing the well with a macaroni string was elimination of the 2½-inch tubing master valve. On the first workover this valve was left on the tree to facilitate rigging up but was of no further use after the macaroni string was in place. On Unit 29 workover this master valve was eliminated by setting a plug choke in the tubing and sealing off the lower section of the well. The pressure above the plug choke was then bled off and the valve safely removed. As soon as the snubbing equipment was rigged up above the modified Tee tubing hanger, the plug choke was pulled through the blowout preventers and the pressure controlled by the use of blind rams in the middle blowout preventer. When pipe was started in the hole, the blind rams were removed and the regular 1¼-inch rams inserted in their place. The 2½-inch tubing master valve was later used to control the pressure in the macaroni string, saving the cost of an additional valve, and at the same time lowering the height of the tree about 18 inches, which made it easier to manipulate the wing valves from the ground.

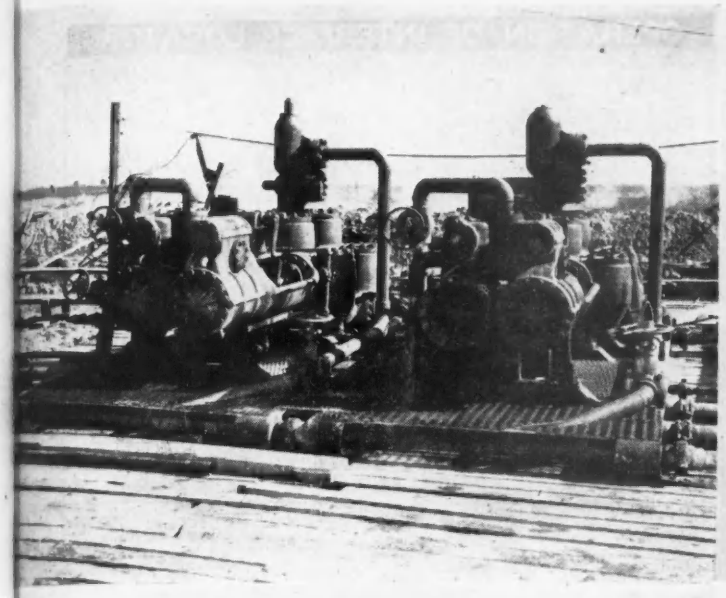
From all indications, this type of workover proved very successful and the performance and resulting production of the once deficient well was far greater than originally anticipated. It could also be termed a success economically, since the net increase in production paid the cost of the workover in a short time. In addition to increased production, several other improvements in the producing characteristics of the well were noted. Daily production from the field could be regulated and constant rate of flow maintained, whereas prior to the workover, some of the wells would load up with fluid and float on the line or produce at variable rates of flow. Inasmuch as the velocity was increased by the use of a macaroni string, the fluid in the well was lifted at a uniform rate, assuring a more accurate gallons per thousand cubic feet of gas test and preventing the accumulation of a liquid head which reduced surface pressures.

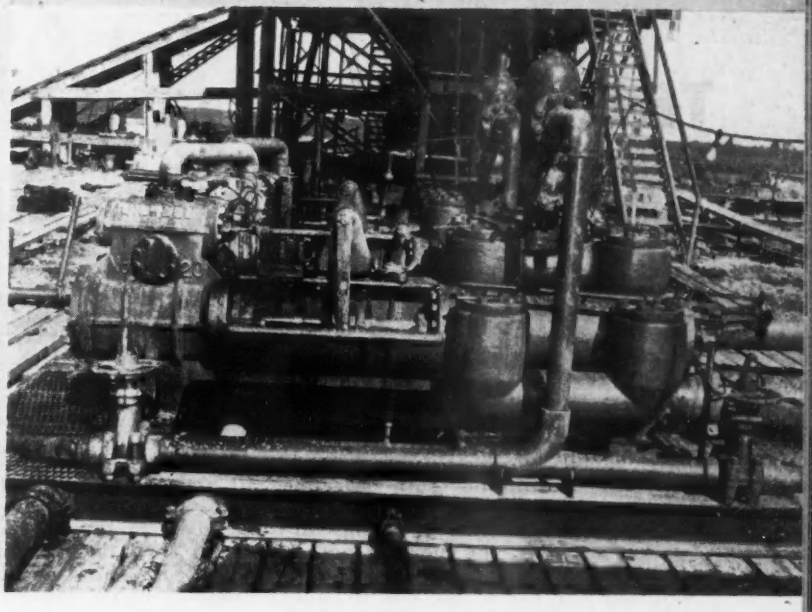
Geology Symposium

A symposium on the Trenton and Sub-Trenton of the Appalachian area will be held by the Pittsburgh Geological Society May 16 at the William Penn Hotel in Pittsburgh.

The purpose is to bring together all information possible on the Trenton and Sub-Trenton rocks of the Appalachian Basin from the surface section on the eastern and northwestern outcrop belt to the sub-surface section across the Basin as interpreted by well records and sample studies, John T. Galey, chairman of the symposium committee, said.

Interchangeable Dual Pump Mounting





Top: The two pumps, mounted side by side, with hammer-type unions tying together the various piping runs and serving to maintain alignment of dual setup. Use of spherical bearing surfaces in connecting unions permit skids to settle independently without overstressing pipe connections. The two high-pressure mud tieins to the main are identical, although mounted on different makes of pumps. The removable section of expanded steel flooring covering gap between skids is a safety factor. Right: From left to right along the I-beam side member of the skids are seen: (1) the blanked off mud line; (2) the exhaust steam collector main; (3) the high-pressure steam main and (4) the clear water service line. Each line is continued straight through the skid, to a union, and thence through the second pump skid. Equi-distant spacing of lines and uniform nipple lengths enable either pump to be placed in the high-pressure position while multiple tiein of lines insures retention of original lineup.

By ELTON STERRETT
Engineering Editor

PAIRED mud pumps, with the second unit as standby and as booster pump when compounded, are regular equipment at most rigs when the depth of hole or known sub-surface conditions require more than a minimum safeguard against down-the-hole troubles with the mud stream. In many instances, these two pump units are individually skid-mounted, and require considerable matching and fitting before they are tied in to the steam line, mud main and other service piping.

One company utilizing dual pumps has devised a standardized mounting which, regardless of the type or make of pump mounted on the skid, has all connections at specified and closely maintained distances from the two centerlines of the skid. Then, through the use of matching hammer-type unions, the two skid-mounted units may be coupled with either unit on the derrick or rig (high-pressure) side.

Further in the development of the idea, all service lines are carried through the main skid members at fixed center distances, and with the protruding ends at the same length throughout. When setting up, the two pump skids are put directly in line between boiler battery and derrick substructure, so that the service lines are brought up to the paired skids, and continued on in straight lines for both directions for ultimate tiein with other units. Thus, the paired pump units in effect "sit across" the various lines, effectively anchoring them against vibration and tendency to shift in service.

All connections to water, steam, exhaust and mud lines from each pump are made within the confines of the skid, with the various control valves mounted along the edge of the skid for ready access and quick servicing. Welded brackets and pads take the thrust of directional changes in pressure lines, and relieve pump fittings of all loads save those arising from internal pressures. Separable type valves and flanged connections at the pump surge chamber enable the mud line to be removed or replaced without affecting any of the tieins below the floor level of the skid.

Priming connections and fresh-water flushing of the pump is covered by the arrangement of water lines at the fluid end of the skid, block gates preventing the reverse flow of mud into the clear water lines.

Expanded metal decking covers the mud-line tie-ins at the power end of the skids, providing a safe and uniform working surface when servicing the units. The flooring is tack-welded to the skid members, and does not interfere with skidding or hoisting the units for transfer to a new location. Only the space directly below the pump body is left open, the remainder all being floored for faster and safer servicing.

The interchangeable skid-mounted units are slightly lighter than the average of such units, due to the use of minimum lengths of pipe. They reduce accident hazards by keeping all piping low, removing the need for the usual connections strung out along side of or atop the skids.

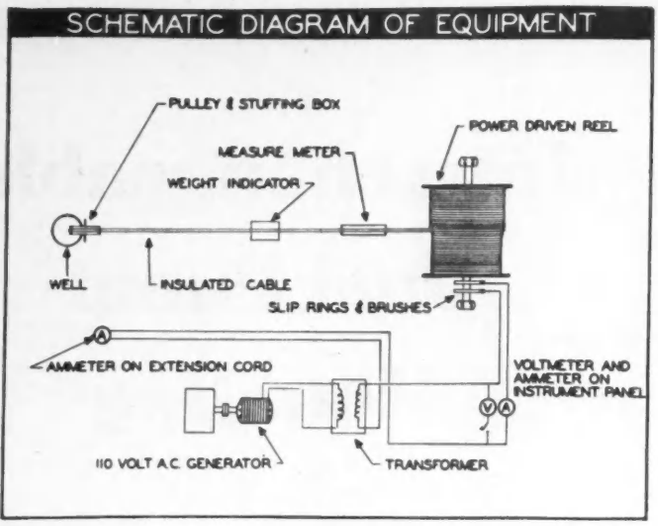


FIGURE 1

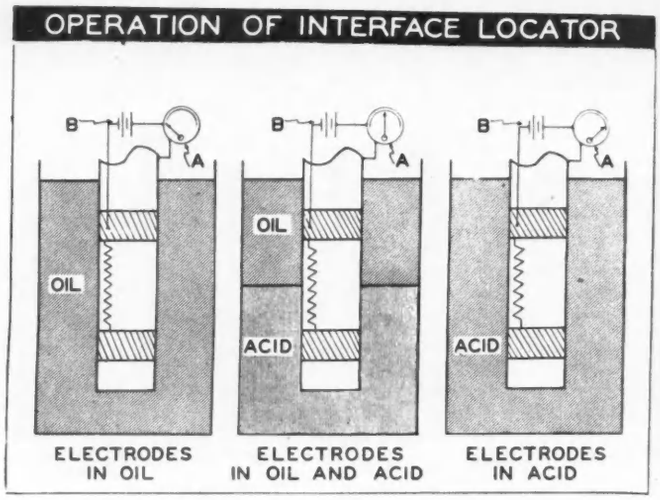


FIGURE 2

THE *Electric Pilot* IN PERMEABILITY SURVEYS

By L. B. SWAN
Dowell Incorporated

SUCCESSFUL application of the "electric pilot" in running permeability surveys in connection with selective acidizing of oil and gas wells, coupled with its use in other bottom-hole surveys, has provided the industry with a very important tool.

Through the use of the electric pilot it is now possible to determine which exposed section at the bottom of a bore hole will most effectively respond to acidizing. Prior to its development other techniques had been employed, success depending upon the completeness and accuracy of well data provided by the well owner or engineer on location. Frequently these were inaccurate and failure of a well to respond to treatment had to be shouldered by the acidizing servicing company. Such failures frequently could have been avoided if accurate knowledge of zone permeability had been available beforehand. To provide this advance information is the function of the electric pilot. Its application during the past several years has proved effective.

The electric pilot[1] is an electrical fluid-interface locating instrument, the electrical circuit of which is completed when electrodes in the well are in contact with conductive fluids such as acid or salt water but not when immersed in a non-conductive fluid such as oil. It can be used to determine the relative permeability of various zones in a well bore or to introduce the treating chemicals into any desired zone. A diagrammatic sketch of the equipment is shown in Figure 1. The insulated copper conductors in the cable and the cable sheaths are connected to slip rings mounted at one end of the reel, which permits electrical readings to be taken while the cable is in motion. Operating current for the

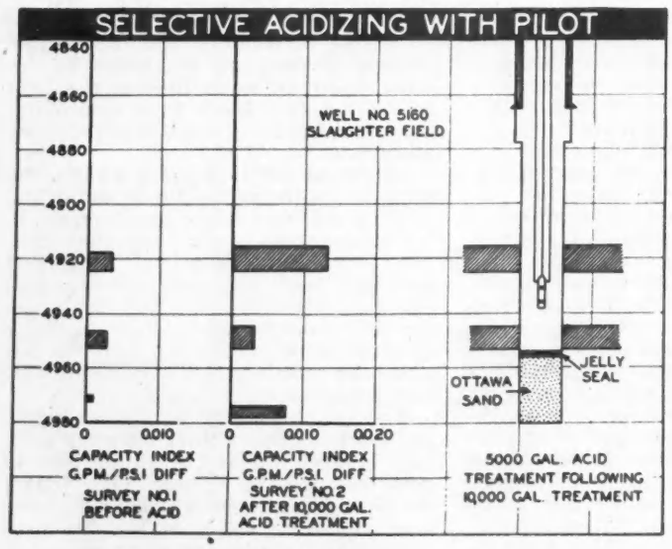


FIGURE 3

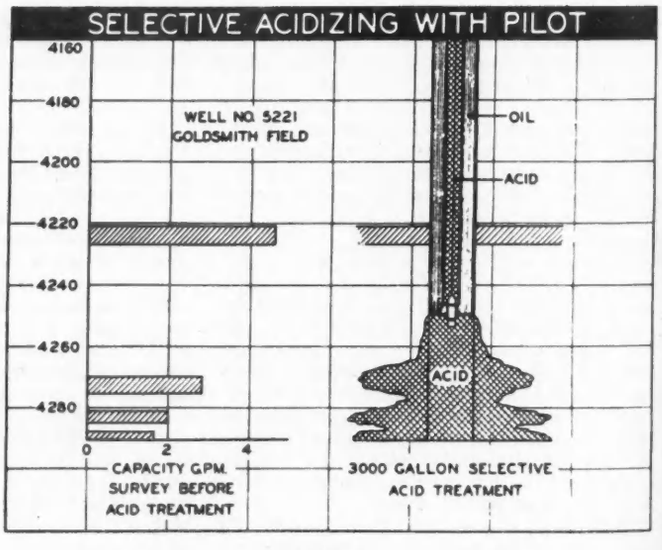


FIGURE 4

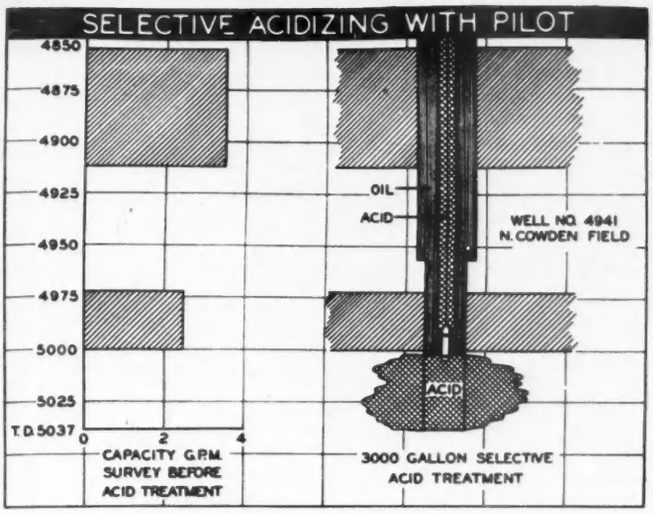


FIGURE 5

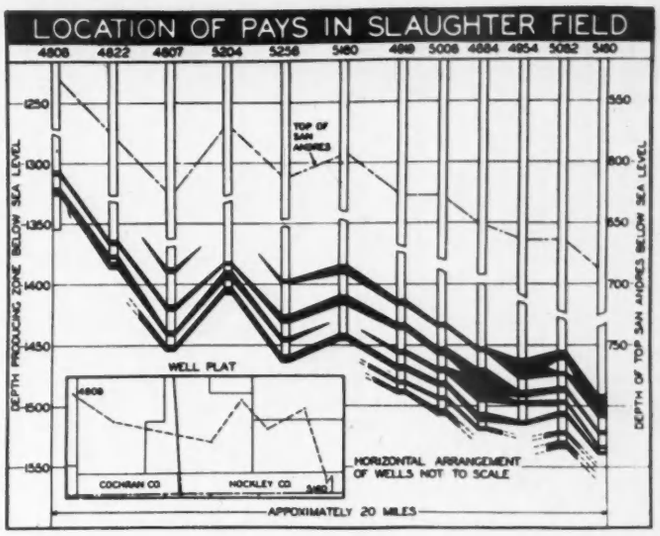


FIGURE 6

unit is supplied by a small alternating current generator connected to a transformer. An ammeter in the circuit shows the amount of current flowing, a direct indication of the location of the conductive fluid with respect to the electrodes at the bottom of the well.

Pilot in Operation

Actual operation of the electric pilot is explained by reference to Figure 2, which shows the electrodes completely immersed in acid. The electrode unit as pictured is connected with the battery "B" and an ammeter, "A." Also shown are the ammeter readings which can be expected under each of the three conditions possible at the bottom of the hole during use. At left only oil is in contact with the electrodes. As oil is a nonconductor, the electrical circuit between the electrodes and the body of the pilot is not completed and the ammeter registers zero. Center illustration shows acid in contact with lower electrode unit and oil in contact with upper electrode unit in the upper part of the body. As acid is a conductor of electricity, the electrical circuit is completed between the lower electrode and the body of the unit. Current now flows in the circuit from the battery to the top electrode, to the resistance, to the bottom electrode through the acid to the bottom of the unit, to the the ammeter and back to the battery. A definite amount of current now is flowing in the circuit and the ammeter shows about a half scale deflection.

Illustration at right shows acid only in contact with the electrode unit and the electrical circuit is completed between the lower and upper electrodes and the body of the unit. Current now flows in the circuit from the battery to the top electrode, through the acid to the body of the unit, to the ammeter and back to the battery. As the resistance between the two electrodes now has been shorted out, considerably more current will flow than was possible in the previous examples and the ammeter now indicates a full scale deflection. Illustrations shown in Figure 2 are analogous to what actually happens in a well. Briefly, when the instrument reads zero it indicates that the acid or salt water is below the bottom electrode; when it gives a half scale deflection it indicates that the interface between the acid or salt water and oil is between the bottom and top electrodes; when it shows a full scale deflection, it indicates that the conductive fluid is at or above the top electrode.

At the present time selective acidizing is accomplished in two ways. The acid is confined either below the electrode unit or above it. When controlling the acid to a bottom section or from the electrode down toward the bottom of the hole, acid is pumped down the tubing, through the electrode unit, and as it comes in contact with the electrodes it is recorded on the surface instruments. As the acid starts up the hole and reaches a point higher than desired, oil is pumped down the annulus between the casing and tubing to control the height of the acid column.

When treating an upper section or a section above the electrode, acid is pumped down the annulus between the casing and the tubing and as it comes in contact with the electrode a definite reading is established at the surface. As acid begins to fall or move down the hole to a point lower than desired, oil is pumped down the tubing, raising the acid-oil interface. These are the two standard types of selective acidizing now undertaken with the electric pilot.

As previously mentioned, the electric pilot has had wide use through many principal fields of the country and besides making permeability profiles for use in selective acidizing it has also found application in high gas-oil ratio control work and in repressuring and workover projects.

Providing accurate advance information of zone permeability is the function of the electric pilot, a proven, important tool

Selective Acidizing

An interesting example of selective acidizing was on a well in the Slaughter pool of West Texas. Referring to Figure 3, this well was surveyed with the electric pilot upon completion and three permeable zones were found. All zones were acidized simultaneously with 10,000 gallons of acid and a test after the treatment showed a potential of 700 barrels per day. The well again was surveyed and it was found that the capacity index of the upper zone had been increased by 230 percent, that of the middle zone 6 percent, and that of the lower zone 470 percent. It was decided to reacidize the middle zone and consequently the bottom zone was blocked off with a temporary plug and the middle section treated with 3000 gallons of acid—using the electric pilot to keep the acid out of the upper zone. Another 200 gallons of acid was pumped into the two upper sections simultaneously. After this second acid treatment a test of the well showed a potential of 1137 barrels per day or an increase of 437 barrels.

Another interesting example of the use of the electric pilot in workover operations is shown in Figure 4. This work was done on a well in the Goldsmith pool. Upon completion the entire lime section below the casing seat was treated with 7000 gallons of acid, resulting in a high gas-oil ratio. The gas-oil ratio on this well increased gradually and on the production test just prior to work-over operations the well made 27½ barrels per day on an 8/64-inch choke with a gas-oil ratio of 5385/1. The well was surveyed with the electric pilot and four permeable zones were found, the upper zone having the greatest capacity. Following the survey the three lower permeable sections were selectively treated with 3000 gallons of acid, using the electric pilot to confine the acid to the bottom sections. This treatment increased the oil production to 69½ barrels on a ½-inch choke with a gas-oil ratio of 1370/1, well below the penalty stage for the field.

A case where the electric pilot indi-

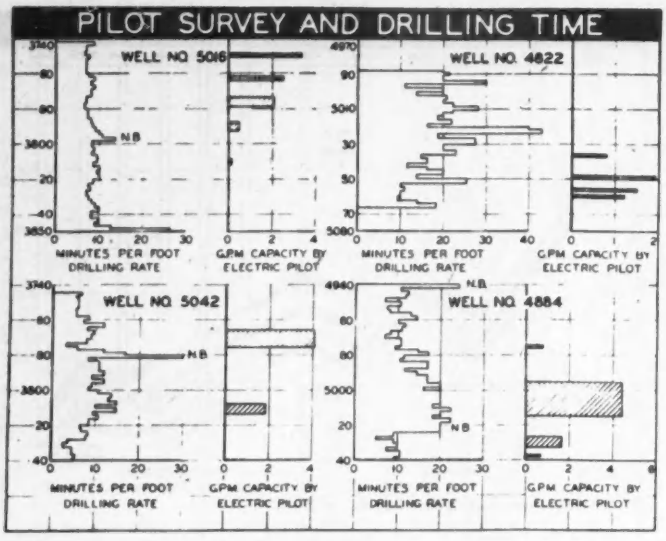


FIGURE 7

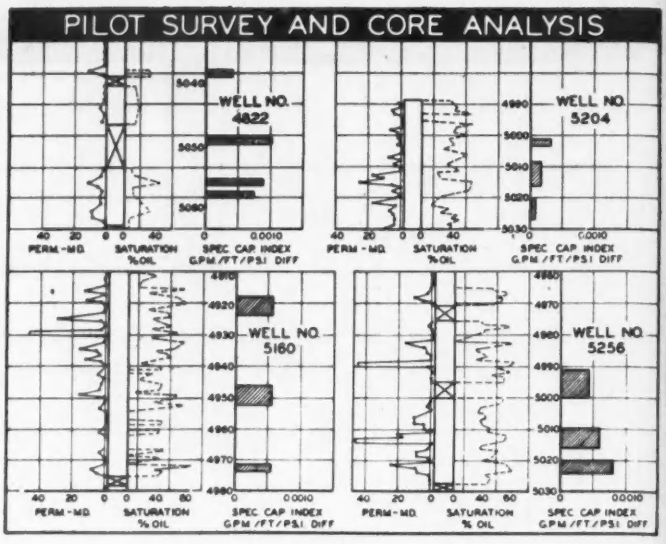


FIGURE 8

cated low permeability in two upper zones but where its use in selectively acidizing a lower permeable formation resulted in 400 percent increase in production is illustrated in Figure 5. A survey upon completion of the well showed permeability from 4856 to 4912 feet and from 4973 to 5000 feet. The sample log, however, showed good saturation from 5000 to 5037 feet. Upon completion the well had a potential of three barrels per hour. The bottom section from 5001 to 5037 feet was selectively treated with 3000 gallons of acid, using the electric pilot to confine the acid to the specified section. A casinghead pressure of 1500 pounds per square inch was required to inject acid into this section. Following treatment the well was tested, showing a potential of 15 barrels per hour, a 400 percent increase. The lower section, from 5000 to 5037 feet was then temporarily plugged off and the upper zone was acidized with 4000 gallons of acid. A casinghead pressure of 700 pounds per square inch was required to inject the acid into this section. This treatment increased the potential of the well by only about 10 percent. It is doubtful whether simultaneous acidization of the entire pay section by conventional means would have resulted in an appreciable increase in the potential of the well, owing to the great difference in the original capacities of the upper and lower sections.

Generally it is found that the ratio of oil to acid which is required to hold the acid at a desired point is much less toward the end of the acid treatment than at the beginning. On selective acidizing jobs this is exactly what would be expected as it indicates that the permeability of the zone being acidized is increased while the permeability of the other zones which receive no acid remains substantially unchanged.

Relative Permeability

The relative permeability of an exposed section is determined by measuring the fluid injection rate into all parts of the exposed formation. Various techniques have been used for these relative permeability surveys but the one which seems to give best results in the majority of wells consists of the introduction of sufficient salt water into the bottom of the well to cover completely all the section to be surveyed and then forcing this salt water into the formation by introduction of oil into the well. The rate of fall of the salt-water-oil interface is determined by means of the electric pilot during the injection of salt water into the formation.

A typical example of a relative permeability survey:

Sufficient salt water first is introduced into the bottom of the well to fill it approximately to the top of the casing perforations. The well then is filled with oil and oil is pumped into it at a constant rate throughout the survey. During this survey the top of the salt water is followed with an electrode unit while pumping of the oil is in progress. As the oil-water interface is pumped down the hole the rate of descent will remain constant until a permeable zone is reached. As permeable zones in the exposed formation are passed the rate of the interface fall will decrease, since some of the oil that was previously lowering the oil-water interface at a constant rate is now being pumped into these permeable sections.

In determining the relative permeability of the various zones in an exposed formation the flow rate into a given zone is determined by taking the difference in the injection rates above and below the particular zones. The calculations usually are figured in feet per minute fall while pumping at a constant rate and this in turn then is converted into gallons per minute, which will be constant as long as no permeable zones are passed and the well bore size remains the same. Also, it should be noted that the injection rate of oil at the surface remains constant.

Permeability surveys are made to determine the thickness of the various permeable sections at the bore hole, the vertical position of these zones at the bore hole, and the relative capacities of the various zones. Also, data obtained from the permeability surveys may be used to calculate three different indexes which pertain to the volume of fluid injected into the various permeable zones. The nomenclature for these various indexes has been set up to correspond with the various productivity indexes except that they are a measure of injected fluid rather than produced fluid. In normal production practices the term "productivity index" is often used. This in itself means barrels per day per pound per square inch differential pressure. This is produced fluid. In the permeability surveys the injected fluid is measured, arriving at a term which is equivalent to the productivity index except that it is in terms of injected fluid rather than produced fluid.

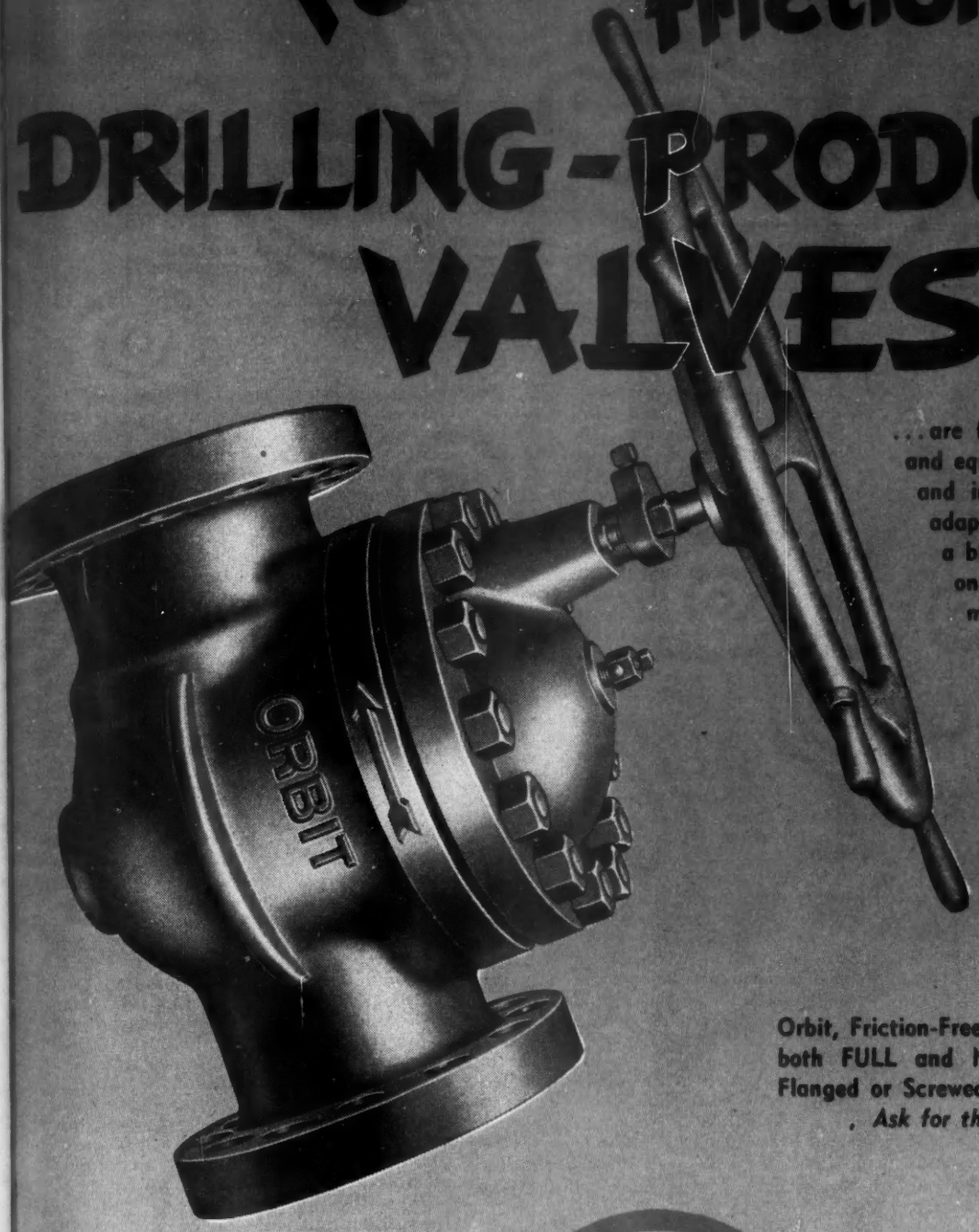
The standard terms or nomenclature used in permeability work with the "electric pilot" are as follows: (1) Capacity — the volume of fluid injected into an individual permeable zone in gallons per minute. (2) Capacity index — the volume of fluid injected into an individual permeable zone in gallons per minute per pound per square inch differential pressure. (3) Specific capacity index — the volume of fluid injected into an individual permeable zone in gallons per minute per pound per square inch differential per foot of thickness of the zone at the bore hole.

Capacity Index

The term "capacity" is the most generally used index for planning initial acidizing procedures and for most workover jobs it is sufficient. For comparing permeability surveys on the same well before and after acid treatment, or before and after a workover job, the capacity index, which is the volume of water injected into an individual permeable zone in gallons per minute per pound per square inch differential pressure, must be used. For comparative purposes the injection rates into the various zones must be corrected for the differential pressure applied. The specific capacity index, which is a direct measure of the actual effective permeability of each permeable zone, appears to be valuable in locating undesirable water or gas zones in a well, particularly in intermediate zones producing these fluids. Where a well is producing from a series of breaks or permeable zones which are all connected to a common water or gas reservoir it is reasonable to assume that the most permeable zones will be depleted of oil more rap-

Full Hole! Positive Seal! Friction Free!

DRILLING-PRODUCING VALVES



. . . are first line protection to men, well and equipment; they are easy to handle and install. This valve is particularly adapted for use in conjunction with a blowout preventer and can be left on a well, after completion, as a master valve.

Friction free opening and closing is effected against non-corrosive resilient seats. These seats are not damaged by the passage of drilling tools, tubing hangers and wire lines.

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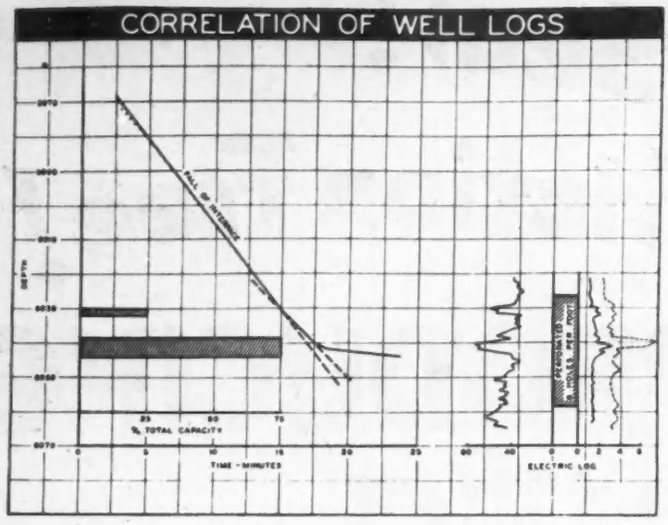


FIGURE 9

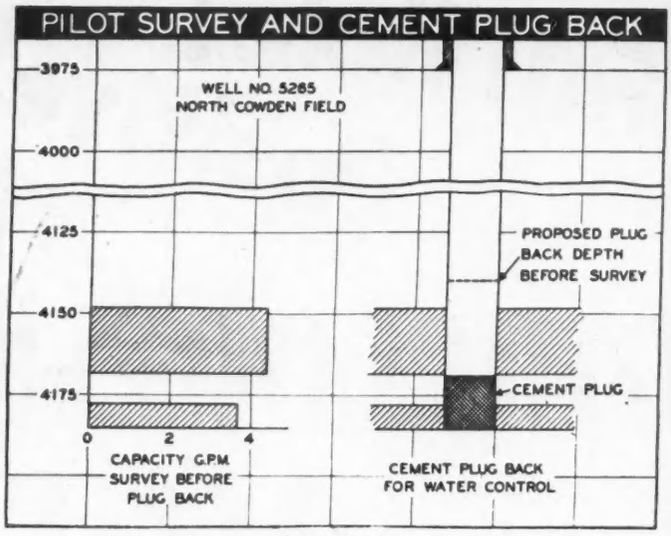


FIGURE 10

idly and that water or gas encroachment will begin through these particular zones.

On permeability surveys which have been run during recent years in most oil producing sections of the U. S. it has been found that with very few exceptions the fluid production of wells producing from a limestone reservoir enters the bore hole through a series of two or more breaks or permeable zones of varying permeability. Figure 6 shows a cross-section of a large lime producing pool in West Texas. On this cross section the zones of permeability as indicated by the electric pilot permeability surveys are shown. This pool is producing from the Permian lime and, shown at the top of the illustration in a dashed line is the top of the main marker in this particular area, the San Andres lime. It will be noted that as this marker dips or rises over the 20-mile cross-section the permeable zones also generally follow the rise and fall of the marker. This cross-section depicts only a few wells in this particular pool. However the close correlation of the permeable zones and the depth of these zones from well to well as compared with the top of the San Andres lime suggest that this correlation exists over the entire field.

It should be noted that the electric pilot relative permeability survey is used only to determine the position of the permeable zones in the well, the thickness of these zones at the bore hole, and the relative capacities of the various zones. It is not used for the determination of saturation, porosity or fluid content of the permeable zones directly, although when used in connection with other well information or well logs it will at times assist in determining the fluid content of such zones. These particular relative permeability logs, in their role of locating and evaluating zones with respect to permeability, appear to be more reliable and accurate than any other method in use. This is true since they are logs that are taken after the wells are put on production.

The electric pilot permeability survey cannot replace or detract from the value of other well logging methods which show the saturation or fluid content of the producing horizon. In workover jobs, acidizing work particularly, saturation and fluid content logs should be used along with the permeability survey in planning the program. The permeability survey as it is now applied has an accuracy of only about 95 or 97 percent so that permeable zones in a producing horizon which contains 3 percent to 5 percent of the total capacity to the well may not be picked up. However, this does not mean that these zones will not produce oil if they are properly acidized. A number of cases have occurred where zones, shown as impermeable by the electric pilot because of mudding or other factors, have shown good saturation on the sample log and, following selective acidizing of these zones, production was greatly increased. Also, in these particular instances where no permeability was shown and the well was then selectively acidized, a survey following the acid job was shown this permeable zone which was opened up with the acid. Figures 7, 8 and 9 show correlations of electric pilot logs to other type logs and surveys.

Pilot surveys for determining permeable zones can be of material assistance to all operators in working out the problems of reservoir control throughout the life of the field and in the control of individual wells during their entire life in well completion, acidizing and workovers. An example of this is shown in Figure 10. A well in the North Cowden field went to water and, just prior to workover operations, was making 98 percent water on the pump. The drilling-time log on the well showed a rather uniform rate of penetration throughout the entire 211-foot section below the pipe so that this log offered little information as to the source of the water. Original workover plans, based upon a study of water-oil contacts in near-by wells, were to plug the well back to 4140 feet with cement. But, before plugging the well back the operator surveyed the well with the "electric pilot." Two permeable zones were found in the well from 4148 to 4169 feet and from 4178 feet to 4185 feet. As a result the plug-back program was changed and the well was plugged back only to 4169 feet.

In any field with either natural or artificial drive, when the operators attempt to produce the field as a unit or exercise any degree of reservoir control, it is necessary to know as much as possible about reservoir conditions and particularly the mechanics of the drainage or the movement of fluids throughout the reservoir to the wells. Knowledge of the exact position, thickness and capacities of the various permeable zones as found with electric pilot surveys appear to be most valuable information concerning the mechanics of drainage of the reservoir. For example, if in a limestone reservoir the production is from a series of lenses with horizontal but little if any vertical communication rather than from one large reservoir with vertical communication throughout, the most efficient method of producing the reservoir would be to deplete all lenses or zones at such a uniform rate that water or gas would not encroach into any well prematurely from any one of the many lenses.

Knowledge of the positions, thicknesses and capacities of permeable zones in each well as it is drilled during the drilling development program of the lease or field is very important. When correlated with other information such as structure position, gas-oil and water-oil contacts and saturation or fluid content logs, the permeability survey data will assist materially in determining casing points, total depths, perforating programs, acidizing, shooting programs and workover operations.

Owing to the nature of limestone reservoirs, the greatly varying permeability and the difference in the physical structure of the drainage channels, any simultaneous acid treatment of two or more permeable zones generally will result in the productivity of one or part of the zones being greatly increased and the productivity of the others only slightly increased. Permeability surveys made before and after treatments have shown this to be true in most cases and they also have shown that the zone or zones which have the greatest capacity before treatment may not have the greatest capacity after treatment. It is not always possible to predict which of the several zones will be benefited most by an acid treatment of all zones.

References

[1] Frank Briggs, The OIL WEEKLY, May 10, 1943, p. 13.

[2] U. S. Patent 2,413,435—assigned to The Dow Chemical Company.

Iraq Petroleum Co.
BUSY IN FOUR COUNTRIES

IRAQ Petroleum Company's current activities in Syria, Lebanon, Palestine and an expansion of the rich Kirkuk field in Iraq, have been described as "probably the most extensive search for oil ever conducted in the Middle East."

Henry Ozanne, staff writer of The OIL WEEKLY, told in the February 3 issue of drilling operations that are under way or about to begin in each of these areas as IPC makes its bid for first position in the race for more oil to pour through its pipe lines to terminals on the Eastern Mediterranean.

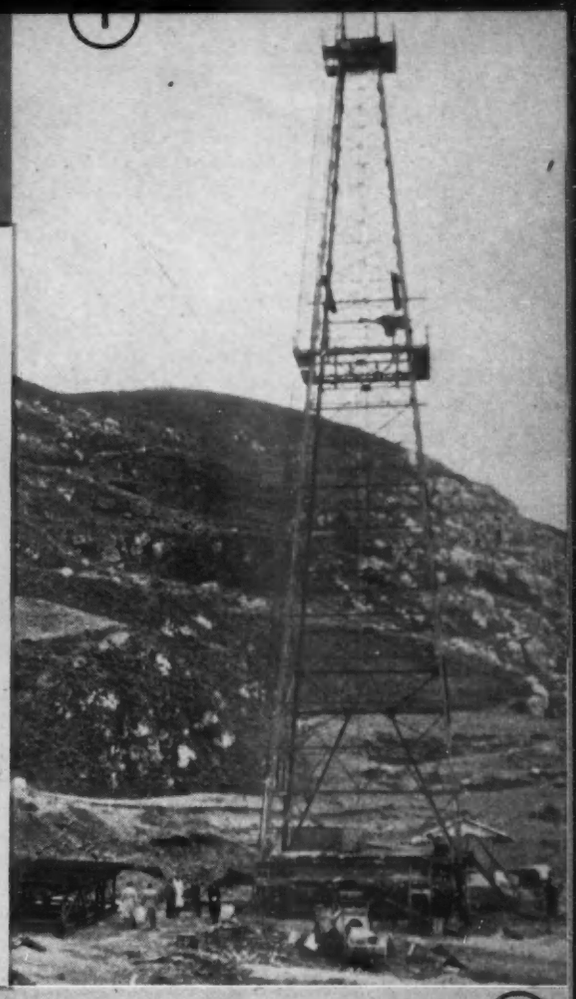
No. 1 shows the derrick of the company's test at Tripoli in the Lebanon.

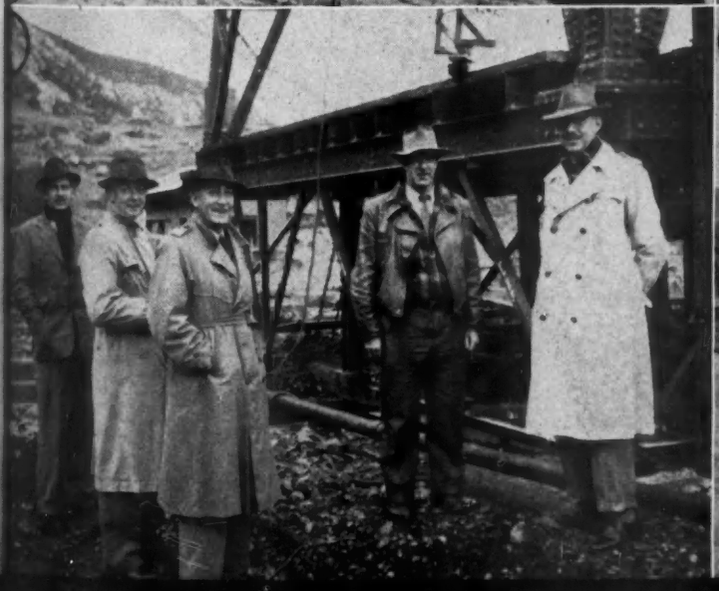
No. 2 shows the Gaza location in Southern Palestine just before the derrick legs went into the concrete.

No. 3 IPC chiefs confer over a map spread out on the wing of their plane. This is the type used when Ozanne flew with IPC personnel over new locations in four Middle East countries.

No. 4, IPC group beside the Tripoli derrick. Left, front to rear: A. W. S. Davidson, in charge of IPC's Tripoli terminal; R. J. D. Belgrave, director of the company's Beirut offices; G. W. Henderson. Right, George Heseldin, IPC's assistant general manager and field chief with G. N. Akin, who came with IPC from California oil fields, behind him.

No. 5, IPC officials vising the Gaza, Palestine, desert location. Left to right: George Heseldin, assistant general manager; K. M. Maude, Dr. Colenzo Jones, IPC's chief of medical staff; A. Booth; J. R. Montgomery of the company's Haifa office and L. J. Teyssot, location manager.





A Tale of Adventure

SCOTLAND'S OIL SHALE INDUSTRY

EARLY in September, through the courtesy of the officials of Anglo-Iranian Oil Company in London, the writer was taken for an extended visit to the Scottish oil shale operations near Edinburgh, Scotland. R. C. Thomson, senior engineer with Anglo-Iranian, was instrumental in obtaining the necessary permission and arranging the trip. To him and the other officials of the company the writer expresses his gratitude.

In Scotland, Robert Crichton, managing director for Scottish Oils, Ltd., the Anglo-Iranian subsidiary company, was most gracious. John M. Caldwell, general mining manager, conducted the writer to several of the mines, the Westwood crude oil works and the Pumpherston refinery.

At Pumpherston Refinery, Alex Anderson, manager of the refinery, conducted a personal tour of the plant, and later visited, with the writer, many of the working mines and pits.

The author acknowledges gratefully these many favors. All the geologic and statistical data was, of course, furnished by the Scottish Oils, Ltd. Some data was taken from a very excellent book entitled "The Oil Shales of the Lothians"[1] by R. G. Carruthers and others, although the book itself was published about 30 years ago. Dr. George Smith, chief chemist, Scottish Oils, kindly proof read the text of the accompanying paper. The author is indeed thankful to all the officers and employes of Scottish Oils, Ltd., who contributed so much to make his visit both pleasant and instructive.—J.B.E.

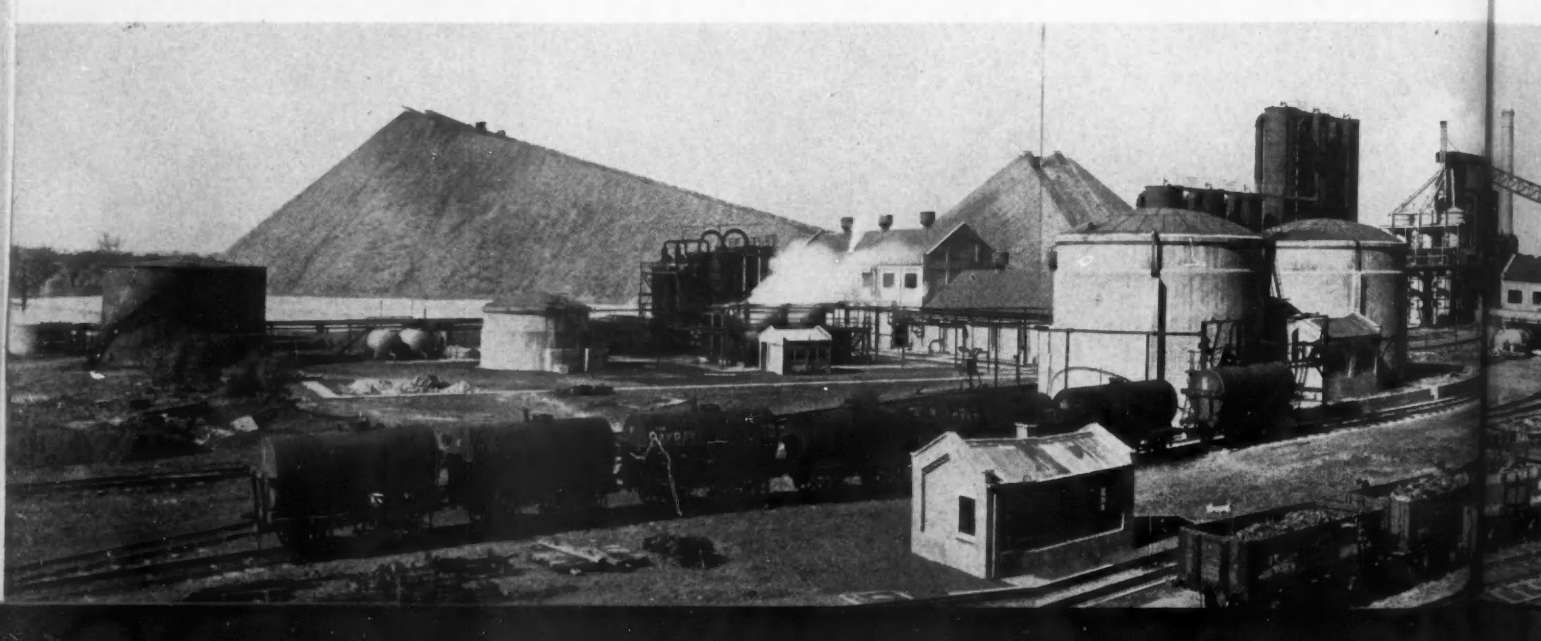
[1] "The Oil Shales of the Lothians," Memoirs of the Geological Survey, Scotland, Third Edition, 1927, by R. G. Carruthers, W. Caldwell, E. M. Bailey, and H. R. J. Conacher.

THE story of the Scottish oil shale industry reads like a tale of adventure, starting in a dim Victorian past, passing through intermittent depressions and periods of prosperity, to an unstable present and an uncertain future. The founder of the industry was Dr. James Young, born in Glasgow in 1811, and whose early life was devoted to the problems of chemistry. In 1847 he marketed some products from a small British oil seepage, but this was soon exhausted.

The great need for illuminants attracted Young's attention to the cannel coal deposits of the Scottish Lothians, 20 miles southwest of Edinburgh. To treat these cannel coals, he obtained a patent dated October 17, 1850, giving him the right to extract "paraffin oil" and other products from coal, and set about building an organization to carry out these plans. With E. W. Binney and Edward Meldrum he formed the company of Young, Meldrum and Binney, and started the first cannel coal distillation plant at Bathgate, West Lothian county, about 25 miles west of Edinburgh.

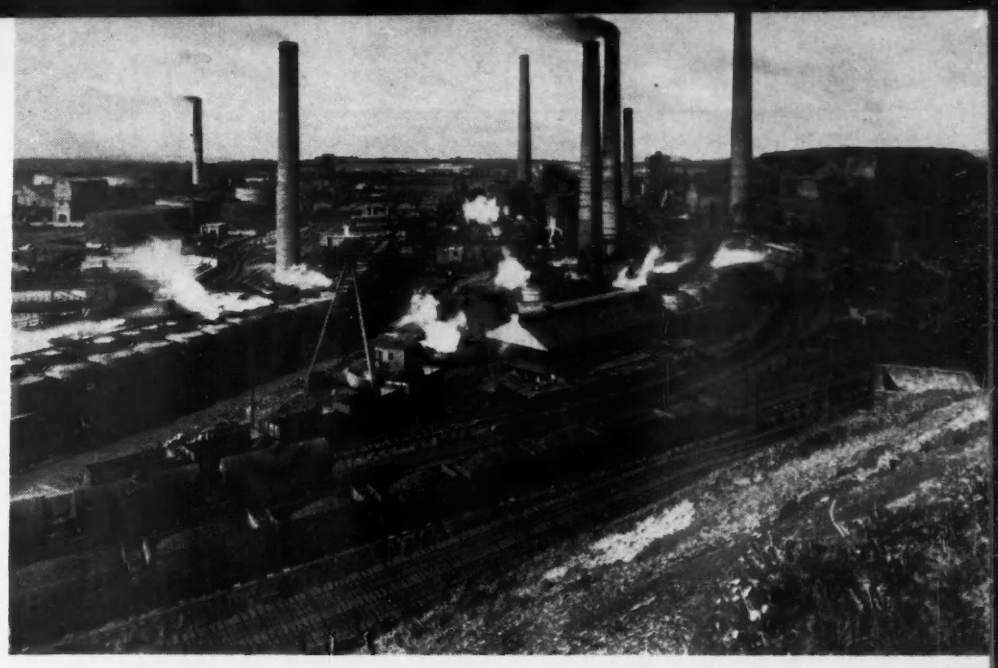
A plan of the stills, dated 1869, shows very capable design and a considerable knowledge of the subject for that early day. However, the cannel coal beds, known as the Boghead coal, were thin and soon mined out and the actual oil shales of the district were gradually introduced. As the oil shales gradually replaced the cannel coal, a virtual storm of litigation was let loose concerning the definition of "Oil shale," the matter of royalty payments, and the interpretation of the patent itself which covered "coal" only. An entire chapter could be written on the various definitions of these two materials, definitions that were legal, geological, chemical, physical, and plain miner's talk. There were many infringement suits but newcomers to the business were not discouraged, and at the expiration of the principal patent in 1864 there were already 38 different plants in operation, which jumped to 120 by the following year.

With the obvious success of oil shale distillation, Dr. Young started the Addiewell plant (see map) in 1865, devoted entirely to oil shale. The location of the plant was favorable to available oil shale outcrops. These operations were successful and the company prospered in the following years. In 1877 the peak of success was reached and the company paid 17½ percent dividends for that year. However, world petroleum events



Spliced panorama below pictures Westwood Crude Oil Works, Scottish Oils, Ltd., showing, left to right, spent shale dump, scrubbing plant, retorts and mine tipples at pit.

By J. BRIAN EBY
Special Staff Representative



The Pumpherston Refinery of Scottish Oils, Ltd., which handles all the Scottish oil shale crude. Located at Pumpherston in middle of oil shale belt.

were rapidly clouding the horizon. Pennsylvania's oil discovery in 1859 and a little later Russia's oil from the Baku region began competing, one with the other in England and Scotland, driving the price of illuminants down and bringing the Scottish oil shale industry to the brink of ruin. Dr. Young died in 1883 and his company failed to pay dividends for the next 20 years.

Due largely to the invention of the combustion engine (automobiles), the years after 1900 were moderately successful, but by 1914 competition again had the industry on the rocks. World War I lifted it up, but during the early twenties, in spite of excellent chemical and mechanical improvements, it again languished. At the end of World War I the six principal oil shale companies operating in the Lothians were brought under one management and the new company, whose ordinary shares were held by Anglo-Persian Oil Company, was called Scottish Oils, Ltd. Since then the whole capital of the operating companies and of Scottish Oils, Ltd., has been acquired by the Anglo-Iranian Oil Company, Ltd.

At the present time Scottish Oils are operating 13 different mines or pits and four crude oil plants and one crude shale oil refinery, all of which are indicated on the map. Of the 13 mining operations, four are pits with vertical shafts, nine are mines with inclined shafts.

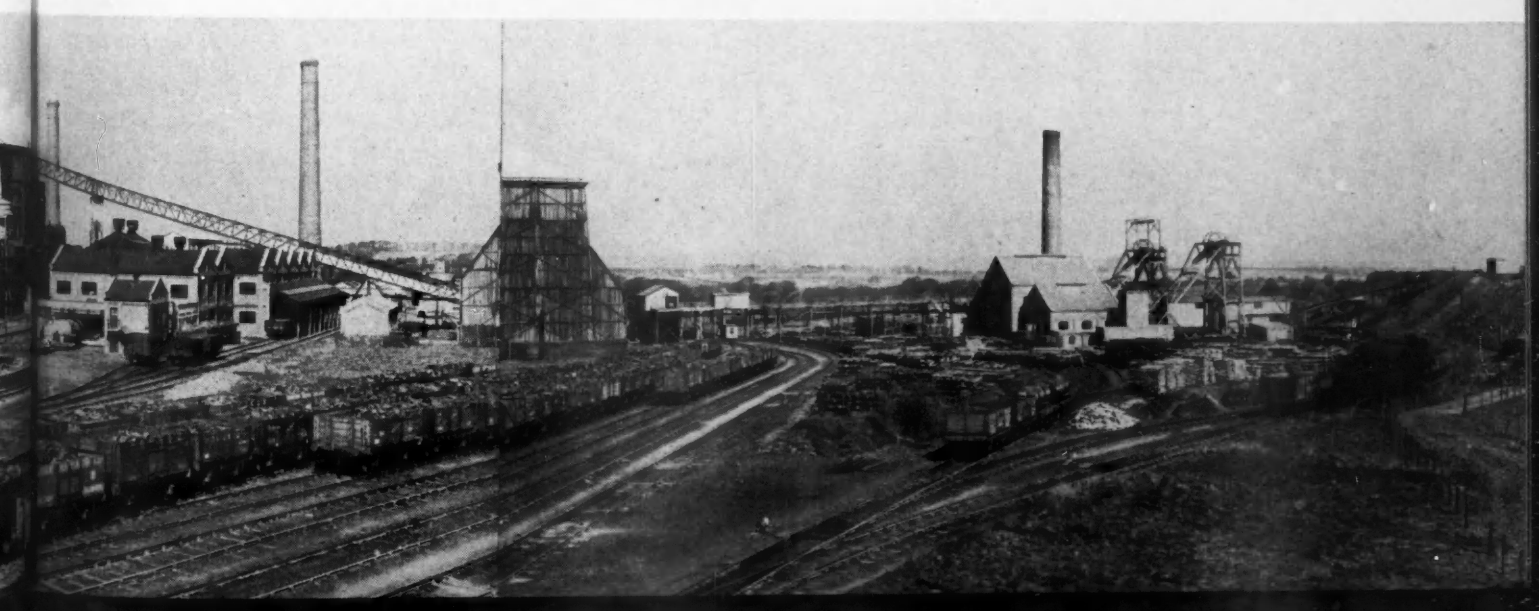
The oil shale belt occurs in the area known as the Lothians and extends southwesterly from the region of the Firth of Forth Bridge, a distance of about 15 miles. The area of richest content covers about 75 square miles. Approximately 1⅓ million tons of shale are removed annually at the present rate. More than 100 millions tons of spent shale have been accumulated and dominate the landscape as gigantic truncated pyramids, locally called "bings." The spent shale is light pink to dull red in color, extremely hard to weather, and after many years supports only the most meager form of turf on the flat tops. Some bings reach a height of 200 feet or more and cover many acres of ground.

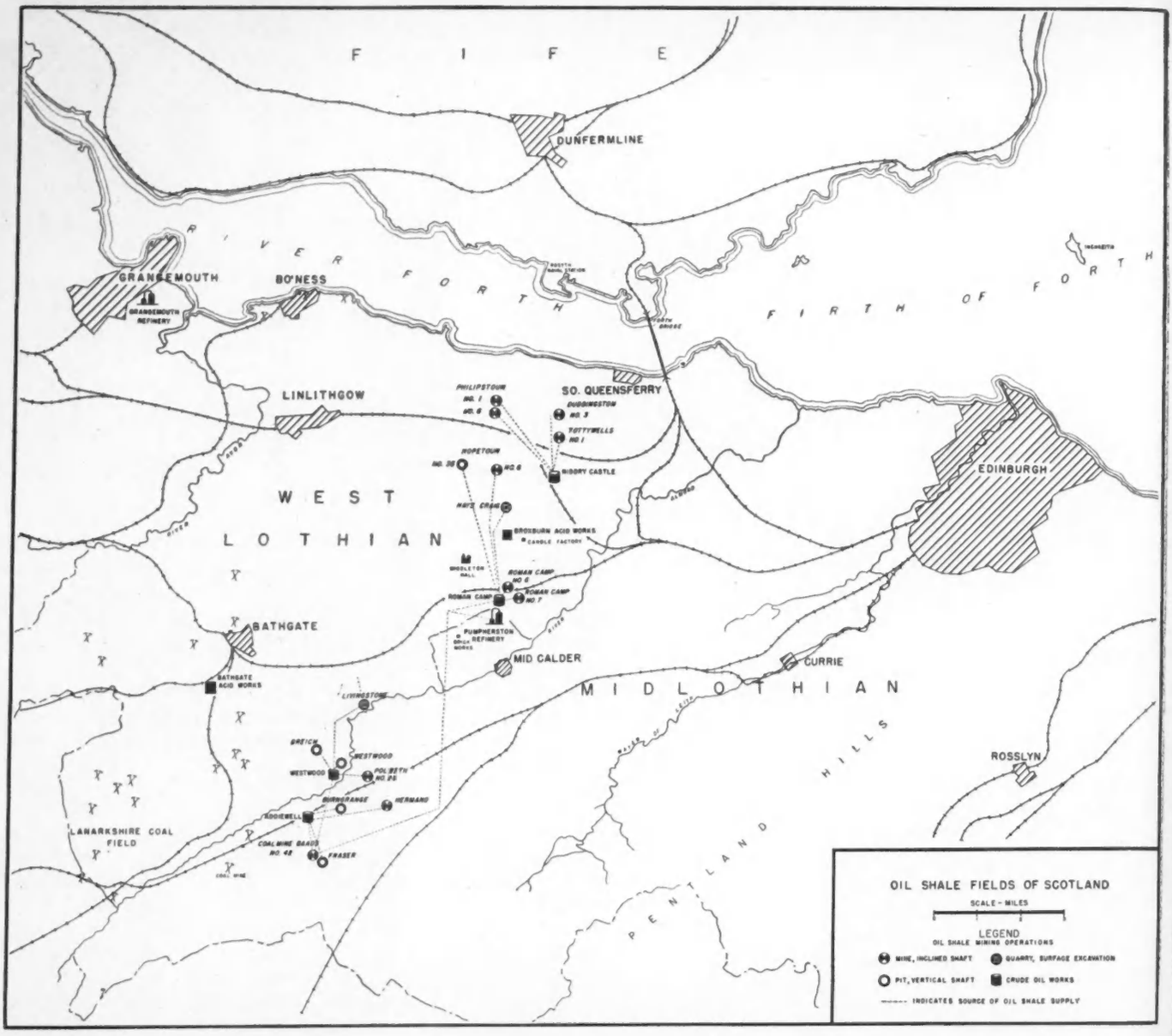
The oil shale beds occur in strata known as the Calciferous Sandstone Series of the Lower Carboniferous. Their general place in the section and names of the beds are given by the columnar section, shown herewith. The entire carboniferous section, which here is about 9000 feet thick, rests on the Devonian Old Red Sandstone.

The general geologic structure of the region is a series of northeast-southwest undulations affecting the strata of the area. The oil shale series therefore have recurring outcrops over a wider belt than would be expected. This serves in turn to bring vast areas of oil shale to within available mining depths. Five major faults also affect the outcrops of the shale deposits, in most cases favorably for mining operations. These faults are east-west in trend and are therefore transverse to the regional structure. They are normal faults with displacements up to a maximum of 1600 feet observed to date.

There are two widespread horizons of interbedded volcanic tuffs and seven distinct volcanic necks have been located. Five sills of volcanic rock (Teschenite) have been mapped, but apparently have only slightly affected the oil shales or their oil content.

Oil shale in place is a fine black to brownish clay-shale, entirely without oil or gas odor, and is tough and resists disintegration in the weather. It is entirely free from grit and can be cut by a sharp pocket knife, in which case the shavings curl up like pencil shavings.



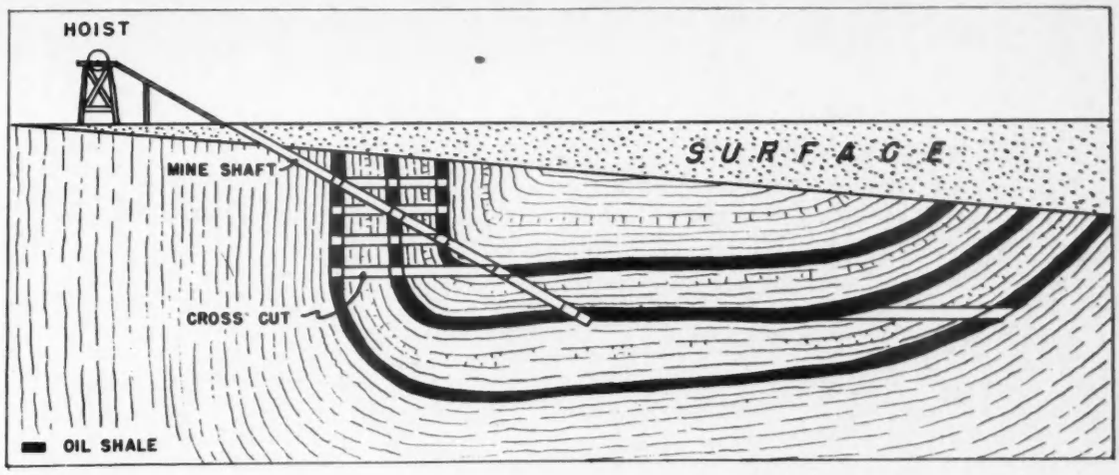


The shale closely resembles a dry tough leather or hardwood. It is never found in contact with or grading into coal. It shows two forms as taken from the ground, one a flat platy shale, the second a curly or "gnarly" shale. Both forms show microscopic lamination. The beds range in thickness from a few inches to 12 or 15 feet.

The oil shale is actually a hardened clay that contains varying amounts of organic matter in a finely divided form. This organic matter is called "Kerogen" or "Pyrobitumen." With the application of heat under favorable conditions, the "Kerogen" undergoes decomposition and distillation, forming a product called "crude oil" and giving off ammonia which is derived from the nitrogen in the shale.

The mining of the shale is carried out quite like coal bed mining, the shafts ranging from 400 to 700 feet be-

At left—Modern mining methods are used as indicated by this electrically-driven undercutter. This is the "curly" shale and the bed is about 5 feet thick. Scottish Oils, Ltd.



Typical Shale Mine Driven in Folded Strata

low the surface. Inclined shafts may be even deeper. The shale is brought to the surface and there broken into pieces of 4 inches or less before being fed to the retorts. A typical oil shale distillation unit consists of 104 retorts arranged in two benches of 52 retorts each. The broken shale is charged into the top of the retorts and its rate of flow is controlled by the discharge mechanism at the bottom. In its passage through the retort the shale is heated to 1400° F. The retort is heated externally by the permanent gas produced in the distillation process and internally by the combustion of residual carbon in the spent shale. Steam and air are injected into the bottom of the retort. The steam reacts with the nitrogen in the shale to form ammonia, with part of the carbon to form water gas, and serves to distribute the heat throughout the retort. The air injected combines with a portion of the residual carbon and serves to heat the shale. The throughput of each retort is 10 to 12 tons of shale per day.

Oil vapor, ammonia, permanent gas and steam pass off from the top of the retort to condensers, where the oil and ammonia water are separated. The gas is scrubbed free from ammonia and light spirit and returned for heating the retorts. The ammonia water is converted into sulphate of ammonia. The spent shale is removed by belt conveyor feeding two large car conveyors, capable of handling 180 tons per hour. To operate such a plant requires 30,000 gallons of water per hour.

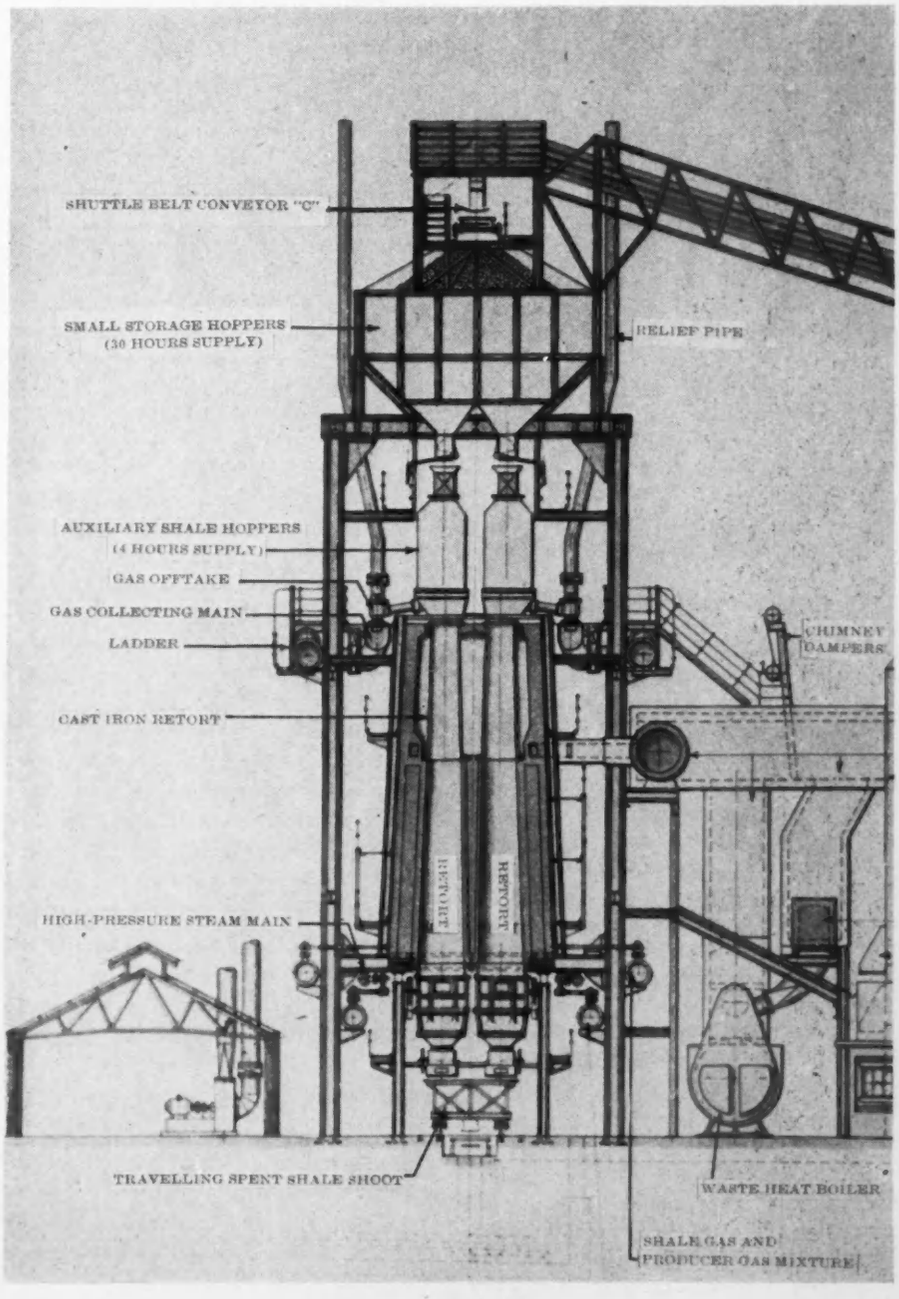
One ton of original oil shale yields on the average 22 gallons of crude oil, and 30 to 40 pounds of sulphate of ammonia. The crude oil gathered from the four crude oil plants is taken and refined at the Pumpherston refinery, which at this time is handling 2300 barrels of crude oil daily, including the crude naph-

• CONTINUED ON PAGE 14

Yearly Production

Scottish oil shale handled for treatment annually every tenth year from 1875 to 1945 inclusive. (Average yield 22 gallons of oil per ton of shale).

YEAR	Tons
1875	423,422
1885	1,741,750
1895	2,236,224
1905	2,491,885
1915	2,992,676
1925	2,408,052
1935	1,408,371
1945	1,398,863



Late Model Shale Retort Unit

Egyptian Exploration Program Most Intense

Part 1

(Of a two-part discussion)

By HENRY OZANNE
Special Staff Writer

EGYPT, as one top industry official describes it, "is the biggest petroleum question mark in the world today." By that phrase he emphasizes the fact that while the future production possibilities of Egypt are as yet almost wholly undetermined, the industry is conducting in this promising land of North Africa one of its most energetic efforts in the world-wide search for more oil.

Egypt is perhaps the biggest wildcat gamble on earth right now. Three companies—two American and one British—are already drilling, and in the eyes of the Egyptian government which is maintaining especially cordial and active relations with the industry, the country is wide open for all comers. There are three unrelated but highly significant factors around which the entire exploitation program in Egypt must be considered:

1. The concession areas of Egypt are geologically akin to the great oil basins of the Middle East—man's largest petroleum reserves. This is particularly true, of course, along the Red Sea coast, as yet the only part of the country where oil has been found.

Egypt Well Advanced

2. The Egyptian government is pursuing an enlightened policy of cooperation with the petroleum industry and, like the industry itself, is committed to an extensive testing of all North Egypt including the Western Desert. The two government officials in charge of administering the nation's petroleum program—Dr. Abu Zeid Bey and El Hanafi El Sayed Fahmy—are University of California graduates, thoroughly familiar with the oil industry and widely acquainted in oil circles around the world. From this standpoint of government-industry collaboration, Egypt is the most advanced of any Middle East country.

3. The industry is following a policy of close, and in certain ways novel cooperation among the various companies operating in Egypt. Socony-Vacuum Oil Company and Anglo-Egyptian Oilfields (Shell) have created a joint account arrangement on all production activity in the Sinai Peninsula south of the 31st parallel. This is an interesting instance of two companies of different nationalities—one American and one British—pooling their drilling efforts directly without the intermediary device of a mutually-owned separate company. And, again, Socony-Vacuum, Anglo-Egyptian and Standard Oil Company (New Jersey's) subsidiary, Standard Oil Company of Egypt, are all cooperating in the joint use of exploration equipment in the Western Desert.

These three companies are the only ones drilling in Egypt since the disposal of the Caltex interests, and in this series of articles on Egypt's oil, I shall set forth in detail what each of these companies is doing and how their current activity fits into the overall pattern laid down by the Egyptian government.

First, however, it may be helpful to give a brief sketch of the history of oil in Egypt and this history may be divided into four periods:

1. *From 1880 to 1906.* Oil was discovered in Egypt in 1880 and the 20 years covered by the period saw the beginning of government prospecting at Gemsa and Gebel Zeit. No exploration nor production was carried on in scientific manner and there are virtually no commercial results recorded.

2. *From 1906 to 1921.* Exploration started in the Ras Gemsa field, but exploitation methods were irregular. The Hurghada field was discovered in 1913 and the Abu Derba field in 1920. During the period production areas were vast and government royalties were set at 5 percent.

3. *From 1921 to 1936.* Little advance recorded. Both the government and Anglo-Egyptian Oilfields as well as The Bechweath Company did some oil prospecting. Leases and exploration covered small areas, and government royalty was raised to 12½ percent.

4. *From 1936 to date.* Areas have become vast, royalty has been increased to 15 percent, and exploration has become extensive. Prospecting has covered the whole Sinai Peninsula and the Suez-Cairo deserts.

Considerable technical advance has been made in Egypt during the last decade. Before 1937 there was no Egyptian technical staff with any of the prospecting or exploiting companies. Now, however, Egyptian technicians, including engineers and geologists, cooperate intimately with all the companies.

Exploration Most Active

Exploration has been intensified by the companies since the close of World War II with further extension planned. Not only are the companies using up-to-date geophysical methods of primary expolration, but there are also six or seven drilling strings continuously at work. The recent discovery of oil at Sudr in Sinai was the first success in the new exploration program following the war.

Egypt currently is producing about 30,000 barrels of crude daily from the two fields discovered by Anglo-Egyptian Oilfields, Ltd., namely, the fields of Ras Gharib and Hurghada on the shores of the Gulf of Suez. The Hurghada field is in decline. To date it has produced around 40 million barrels, while the younger Ras Gharib field, discovered in 1938, has a cumulative total production to date of about 60 million barrels. From 1913 to 1939, the outbreak of the war, Hurghada produced 28 million barrels. During that 26-year period 120 wells were drilled of which 76 are still producing.

Ras Gharib and Hurghada crude is taken by tanker to Suez where it is processed by the Anglo-Egyptian Oilfields refinery, built in 1913. AEO also furnishes royalty crude oil with which the Egyptian government operates its refinery at Suez, built in 1933. The Suez refineries, backed by the production of Red Sea crude, were extremely important during the war. The severing of communications by the Axis military and the drastic reduction of coal imports had slight effect on Egypt which actually stepped up her whole industrial activity during the war, largely by the use of her own oil products.

The Egyptian government is thor-

oughly aware of the implications of oil for its country and has shown a more collaborative attitude toward private industry than is found in any of the other Middle Eastern nations. The government is collecting about $15 million yearly in taxes on oil and its products, and, looking toward a sharp increase in internal consumption, is planning to enlarge its Suez petroleum refineries. Recent figures show that about 1,672,000 metric tons of petroleum products are being consumed within Egypt annually, an amount which is 10 times the consumption of 1914.

El Hanafi El Sayed Fahmy, deputy director of Egypt's Department of Mines, and in charge of his nation's production program, told me that Egypt would be receptive to the entrance of any other companies which may care to search for oil, and in furtherance of that policy no blanket concessions are contemplated. Hanafi Bey, who holds the degree M.Sc. in petroleum engineering from the University of California, and who worked with Marland Oil Company in Oklahoma and has had experience in the Texas and California fields, says:

"Our partnership with the American-British industry has been pleasant and encouraging so far. If there is oil in Egypt in larger quantities than we have yet found, we intend to discover it and then to utilize that oil in the best interests of the Egyptian people. We welcome the collaboration of any and all companies in the industry which can help us achieve that goal."

A close liaison is being effected between the American companies and the Egyptian government through Don Sullivan, formerly with Union Oil Company, now petroleum attache at the American Legation in Cairo.

There is no enacted petroleum legislation in Egypt although draft of such legislation has been prepared. At the present time concession terms are a matter of individual company negotiation. However, policy has become standardized generally as follows:

Government Requirements

Any company wishing to undertake work in Egypt must first apply for a permit from the Department of Mines. The grant given the company at this stage of negotiations specifies the areas which may be explored—parallelogram in shape. The permit permits exploration only, typically for a period of one year but renewable for another two or three years.

Then a license to drill is granted. This permit is usually issued for two years, renewable for a third, and requires that the companies must start drilling before the end of the second year and must maintain continuous drilling to hold the license.

Afterward a mining lease is granted "to extract" from a determined field. This lease characteristically is for 30 years and is renewable. It specifies 15 percent royalty. To hold this mining lease one string must be kept in continuous operation. If production falls below a fixed minimum, work must be concentrated on raising output to the minimum level.

Each of these stages requires cash deposits, usually 25,000 Egyptian pounds ($100,000) for a lease proper and other cash guarantees at specified times.

With this historical resume and exposition of policy, I shall now set forth an account of the actual exploration and drilling work in Egypt, with special reference to postwar developments in the industry.

1. ANGLO-EGYPTIAN OILFIELDS, LTD.

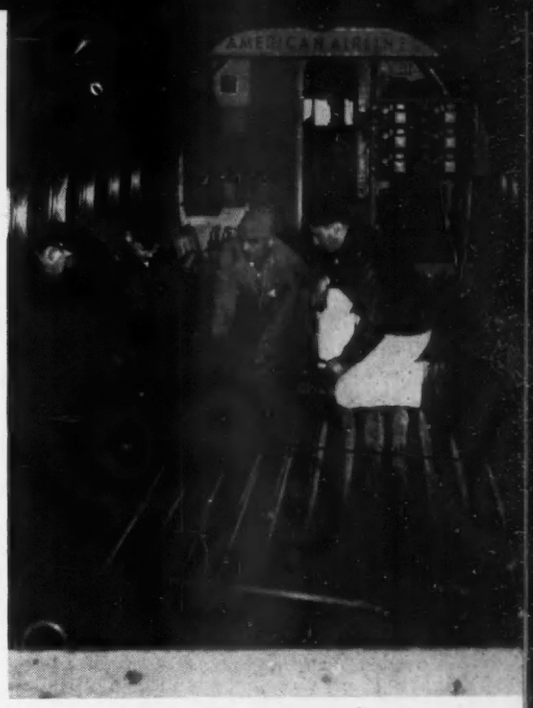
Shell's producing company is Anglo-Egyptian Oilfields, Ltd., and its products are marketed by Shell Company of Egypt, Ltd., and Shell Petroleum Company, Ltd. It is the only company that has found oil in important commercial quantities in Egypt up to this time.

Anglo-Egyptian Oilfields started operations in Egypt by developing the Gemsa field, which was discovered in 1908. Twenty-one wells have been drilled in this field, but production now has ceased except for intermittent flow from one well. In 1913 AEO began operations at Hurghada, discovering oil with the first well, and since then 130 cable tool and five rotary drilling wells have been drilled there, but no work has taken place in the field since shortly before World War II.

In 1937 rotary drilling was begun at Ras Gharib and the first well (except for two early cable tool wells) was a producer. The Ras Gharib field was intensively developed during World War II and by the end of 1946 a total of 116 wells had been completed there with a total footage of 272,053 feet. Drilling is proceeding continuously with one string.

AEO has prospected an area of 43,000 square miles in the Eastern Desert, Sinai, and some in the Western Desert. During the war Anglo-Egyptian developed a two-way program: to increase the throughput of its Suez plant and to intensify exploitation of the Ras Gharib field. Both were under way at the outbreak of the war but, because of shortages of shipping and materials all through the war, it was necessary for AEO to operate with old equipment and a minimum of construction and maintenance supplies.

But in spite of these obstacles, since 1938 annual throughput of the Suez refinery has increased from 980,000 barrels to 8,750,000 barrels and the number of its employes has trebled. During the same time Ras Gharib has developed from a small exploration camp in the desert to a major oilfield of 108 producing wells with an output of around



U. S. PIPE BY AIR FOR AEO—An Egypt-bound transport plant recently took off from the Pittsburgh airport carrying the largest shipment of tubular steel pipe ever made to such a distant spot by air. The tubing was needed to repair Anglo-Egyptian Oilfields, Ltd.'s refinery at Suez. Airline and steel company officials are shown here supervising the tieing down of the pipe in the fuselage so there can be no shifting of the 14,326-pound cargo during the 7400-mile flight. The trip took about 33 hours flying time.

AEO Drilling Record

Apart from cable tool exploration wells drilled at various times prior to 1930, the following rotary exploration wells have been drilled by Anglo-Egyptian Oilfields since 1937:

NAME	General Area	Date Spudded	Date Completed	Total Depth (Ft.)
Gharib West 1	Gharib West	4/13/39	8/ 1/39	5023
Gharib West 2	Gharib West	7/19/39	9/14/39	4100
Gharib North 1	North of Gharib	4/ 5/40	6/12/40	4425
Gharib West 3	Gharib West	4/23/40	6/24/40	4000
Shagar 1	S. W. of Gharib	8/ 2/40	10/ 4/40	4265
Gharib West 4	Gharib West	11/ 5/40	1/28/41	4975
Ayun Musa 1	Sinai Peninsula	12/23/44	5/28/45	5451
Gharib North 2	North of Gharib	6/23/45	11/13/45	6474
Ayun Musa 2	Sinai Peninsula	8/25/45	1/ 5/46	5808
Asl 1	Sinai Peninsula	12/ 2/45	4/23/46	4328
Myos Hormos 1	N. of Hurghada	12/19/45	4/ 6/46	5024
Sudr 1	Sinai Peninsula	2/15/46	3/30/46	3157
Myos Hormos 2	N. of Hurghada	6/11/46	10/20/46	5800
Nebwi 1	Sinai Peninsula	9/ 2/46	.....	....
Ataka 1	W. side of Suez Canal	12/ 8/46	.....	....
Misalla 1	Sinai Peninsula	1/14/47	.....	....

Scottish Shale Industry

• CONTINUED FROM PAGE 9

24,000 barrels daily and with a colony of more than 3000 employes with their wives and families.

These developments, including the building of tanks, roads, houses, stores and machine shops, laying of land and sea oil lines, erection and maintenance of plant and machinery, were due to the effective teamwork of Egyptian and European engineers and artisans. A complete town has been built in the desert at Ras Gharib. All staff and labor receive free accommodations for themselves and their families.

Employe Accommodations

Water, brought from Suez in returning tankers, is provided free. Bath houses and laundries with hot and cold running water are provided the workers as well as gas-fired bakeries which they use without charge. Electric lights have been authorized and gas installations for home cooking. There is also a commissariat at the field run on a non-profit basis and this augments the free rations given each family. A slaughter house has been built where imported cattle are killed.

The men work a six-day week and receive pay and allowance for seven days as well as 16 holidays a year on full pay and free transport. Holiday feasts are celebrated and programs of competitive sports are sponsored. The Ras Gharib Club, comprising all Egyptian and foreign clerical and technical staff, is housed in a building on the coast overlooking the Gulf of Suez and boasts high class recreational facilities.

Anglo-Egyptian Oilfields has spent more than $5 million in exploration work in Egypt. Wildcat activity was greatly slowed during the war. However, the Ras Gharib field was pushed through all the war years. It is now about 80 percent drilled up, but some offshore drilling is planned here. AEO now has two wells on water sites.

The company now has a five-string drilling program under way—four exploration and one exploitation. Three of these are in Sinai, one at Mount Ataka which was spudded in just before Christmas, 1946. In March, 1946, the company got a showing in the Miocene at Ras Sudr along the coast in western Sinai, about 40 miles below Suez. The first Sudr well was drilled to 3157 feet then plugged back to 2925 feet. Pumping tests on the interval between 2680 and 2925 feet showed a capable rate of 280 barrels a day, gravity 936. A second well is now going to basement at the same location.

The Sudr wells are on joint account with Socony-Vacuum, each company to receive 50 percent of production. AEO is testing two other locations in the same area as Sudr, both typical of the Red Sea-Gulf of Suez structures.

Considerable interest has arisen over thas recovered from the retort gases. The Pumpherston refinery is modern in all respects and employs about 550 persons.

SHALE COMPANY HEADS

Robert Crichton
Managing Director
Scottish Oils, Ltd.

John M. Caldwell
Mining Manager
Scottish Oils, Ltd.

the Sudr discovery. Both the Egyptian government and AEO believe that new fields must be found to compensate for the decline of Hurghada and the peak of the Ras Gharib fields. Several experts feel that such a field has been found at Sudr. Neil Gray, AEO's production manager at Cairo (now assistant general manager of Shell Petroleum Company) is conservative in his initial estimates. He says:

Prospects at Sudr

"Oil has been found at Sudr in commercial quantities, but further wells are to be drilled to decide whether the expense is justified in installing production and handling facilities."

Drilling in Egypt is difficult in certain ways—structures are fault blocks, not anticlines. In desert work heavy reliance must be placed on test drilling and seismograph readings. AEO is still confining its major activity to the Red Sea-Gulf of Suez area. Socony-Vacuum in general favors the same area but does plan some geological work in the Western Desert. Standard Oil Company of Egypt, on the other hand, has begun an extensive search in the Western Desert. This latter venture represents the greatest wildcat gamble. If oil is found in the Western Desert, the whole North Africa coast west of Cairo will become attractive new ground. If oil is not found in the Western Desert, Egypt's petroleum future is considerably dimmed.

Editor's Note: The concluding article of this series which will describe current operations in Egypt of the other two companies drilling there—both American: Standard Oil and Socony-Vacuum, will appear in an early issue.

The products of the refined crude oil at Pumpherston are listed below:

	Percent
Motor spirits	16.0
Naphtha	3.0
Diesel oil (light)	52.0
Waxes	9.5
Coke	3.0
Tar	11.5
Resin	1.0
Gas and loss	4.0

The refined products, motor spirit and diesel oil, due to lack of import duty, have a preferred position in the local market. The motor spirit is blended with imported spirit and tetraethyl lead, resulting in a 70-octane number gasoline. The naphthas are used as solvents, such as dissolving rubber and as a constituent in paints.

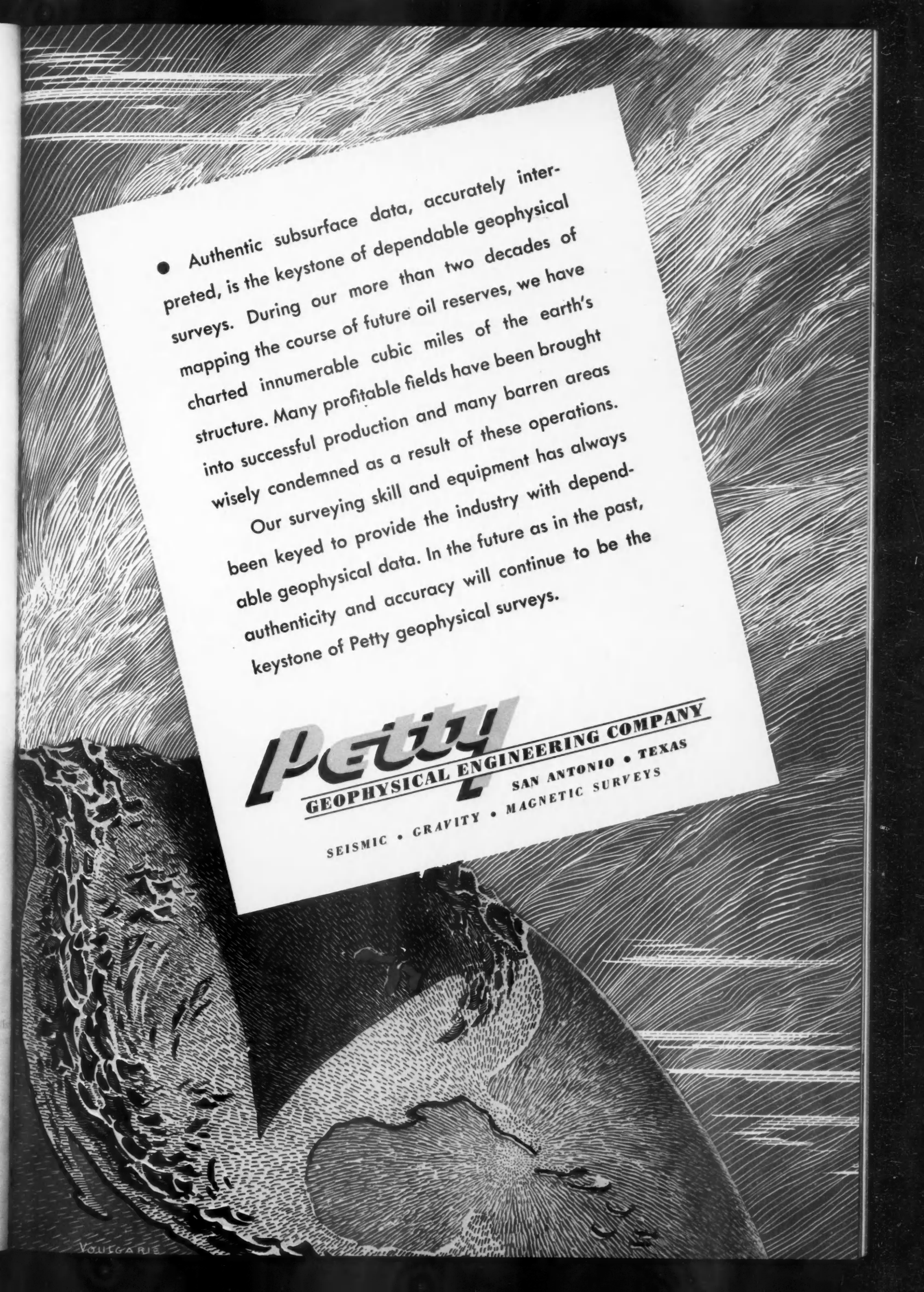
Products In Demand

The diesel oil is an excellent fuel for diesel engine road vehicles and is supplied to the market over a wide area in Scotland and North England. The waxes, with melting points from 100° F. to 135° F., are turned into candles, used for polishes, paper impregnation, matches, in chlorination and wax emulsions. The fuel tar, refinery acid sludge, is used for burning in the refinery. The coke is 99.2 percent pure carbon and of low volatility, and as such makes a good domestic fuel. It is likewise used in making electrodes. The resin is used for roofing felt binder, and the remaining gas is returned to the refinery fuel burners.

Spent Shale Used

After some experimentation, Scottish Oils has developed a highly satisfactory brick made by adding lime to spent shale. After moulding into the desired shape, the bricks are hardened by subjecting them to steam under 150 pounds pressure for 5 hours. At the present the brick plant is turning out 50,000 bricks daily of a weight of 3¼ tons per thousand bricks. While a very durable brick, the market is limited by freight rates and local needs.

Scottish Oils is aggressively attacking the problems of new developments in the chemistry of oil distillation from shale. It maintains an excellent chemical and physical research department, and faces the future with confidence. Like all other industries, however, it has the immediate and pressing concern of higher costs and higher wages without the corresponding higher prices for its products.


• Authentic subsurface data, accurately interpreted, is the keystone of dependable geophysical surveys. During our more than two decades of mapping the course of future oil reserves, we have charted innumerable cubic miles of the earth's structure. Many profitable fields have been brought into successful production and many barren areas wisely condemned as a result of these operations. Our surveying skill and equipment has always been keyed to provide the industry with dependable geophysical data. In the future as in the past, authenticity and accuracy will continue to be the keystone of Petty geophysical surveys.
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Victoria, Australia—

Only producing area in Australia is the Lake Entrance field, discovered in the early 20's, where 50 wells have been drilled with most of them encountering only slight shows; of a total of 189 tests, government sunk 129.

THE search for oil in the State of Victoria, Australia, has been more or less continuous for the past 30 years, being interrupted only during World War II. However, the work, which was commenced in 1914 by private enterprise, has not claimed very much success.

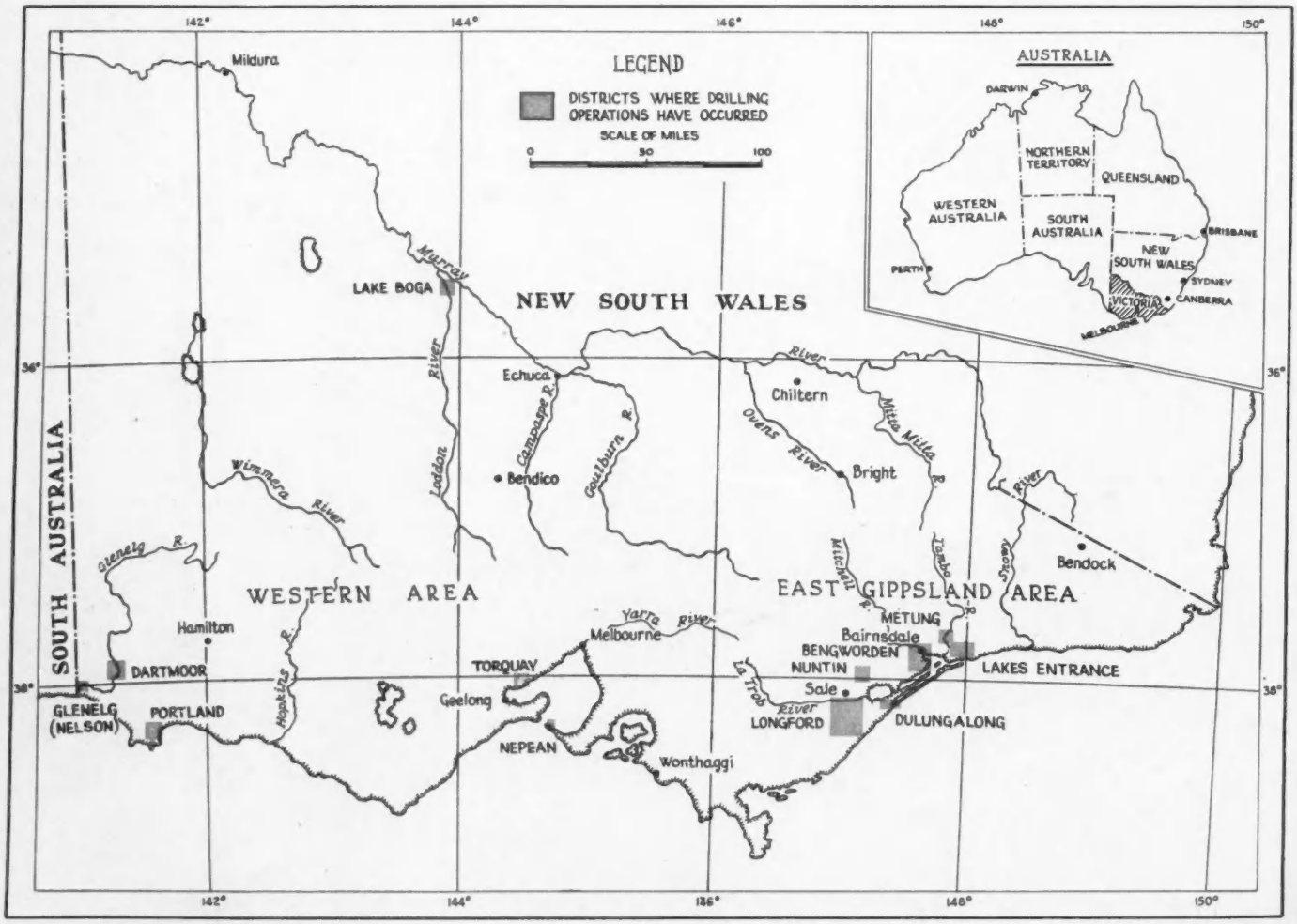
In January, 1920, the federal government offered a reward of 50,000 Australian pounds (about $161,000) for the discovery of petroleum in commercial quantities in Australia. This offer later was withdrawn (in 1925).

However, shortly after this announcement, a number of unsuccessful efforts were made to find oil in various localities, and in February, 1924, a test was drilled by a private company at the head of Lake Bunga. At a depth of 1070 feet, a flow of artesian water was struck, producing 125,000 gallons daily, with traces of mineral oil and a strong flow of methane gas. The test bottomed at 1200 feet on metamorphosed strata. The quantity of oil was small but this is regarded as the first authentic strike of oil in the State.

Slight Oil Shows

This discovery led to an exciting era of leasing eastward to Ewing's Morass and westward toward Bairnsdale. In 1926, a second wildcat test was drilled 2 miles farther west, and at 1210 feet glauconite was entered, continuing for 62 feet. Samples of this formation showed globules of emulsified oil, the core freely effervescing on its surface. Exhaustive tests showed that about 1 pint of oil per day was obtainable from the test, with an artesian flow of 1500 gallons of water daily below the glauconite.

These wells were the first drilled in



Victoria, Australia, Drilling Operations Map

Fig. 1

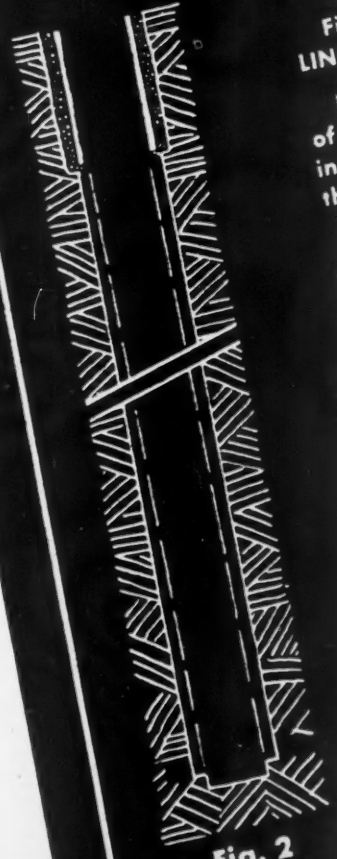


Fig. 2

Fig. 3

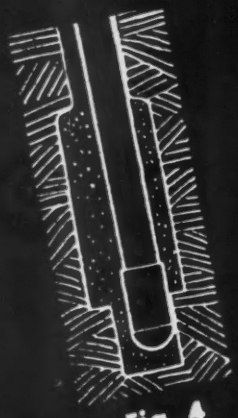


Fig. 4

Fig. 5

Fig. 6

These typical uses illustrate a few of the many worthwhile applications of the Baker Rotary Wall Scraper. Thousands of runs at varying depths, "wall scraping" different formations, in wells in every oil producing country, assure success in your well.

Figure 1—WATER SHUT-OFF TESTS are made after rat-holing below the shoe, "wall scraping" for a vertical distance of 5 feet or more to the gauge of the original hole (or slightly beyond). A successful shut-off test usually is secured.

Figure 2—ENLARGING HOLE TO SET CASING OR LINER with maximum ease and safety.

Figure 3—REMOVING MUD SHEATH from the face of the formation to permit cement to bond with original formation. This same procedure is used to scrape the face of the oil sand to increase production.

Figure 4—BOTTLENECKING to insure complete encasement of the shoe joint with cement; also to minimize hazard of channeling at this vital point.

Figure 5—ENLARGING HOLE FOR C.P. JOB—showing "bottlenecked" section with casing or liner serving as water string above, and oil string below, the cementing point.

Figure 6—GRAVEL PACKING is easily and effectively performed when the hole has been enlarged with a Baker Rotary Wall Scraper.

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the Lakes Entrance field, the only producing area in Australia. There have been approximately 50 wells drilled at Lakes Entrance with most of them encountering slight shows of oil. However, the total production has amounted to only a few thousand barrels of oil.

Huge Lens Noted

The drilling at Lakes Entrance has proved that the glauconite series of marine Upper Oligocene Age, which carries the oil in its native state—not having been affected by migration—exist for a length of more than 10 miles. The series has a width of about 2 miles and forms a huge lens.

The Tertiary beds have not been subjected to folding as is the case in the great majority of Tertiary oil fields in other parts of the world, and therefore the oil contents are as originally imprisoned.

Area's Deepest 3400 Feet

Practically all of the oil produced at Lakes Entrance has been produced in the form of an emulsion, which is subjected to a dehydration process to effect a separation of the artesian water. In some cases when pumping of the emulsion has been temporarily discontinued, the oil gradually rises to the surface of the well, though usually at a slow rate and in small quantities.

Records show that the deepest test drilled in the Lakes Entrance field reached 3400 feet and had a show of oil in the glauconite at about 1227 feet.

Wildcatting Program

Discovery of oil at Lakes Entrance led to other wildcatting in the East Gippsland area of the State of Victoria and as well the Western area.

In the Bengworden area, south and southwest of Bairnsdale, 21 tests have been drilled since 1927 varying in depth from 1000 feet to 4000 feet. However, none of the tests picked up showings of oil. In the Longford area, about 50 miles southwest of Lakes Entrance, 40 tests have been drilled since 1919. However, these tests were shallow, the deepest going to only 1500 feet.

Dartmoor District

More than 24 tests have been drilled in the shallow Dartmoor district in the Western area since 1926, the deepest going to 564 feet with no shows logged in any of the ventures.

The earliest drilling recorded in the State of Victoria was in the Portland area south of Hamilton (see accompanying map). In 1894, a test was sunk to 2265 feet with no shows reported.

The deepest test drilled by the government was one near Glenelg in the extreme Western part of the State. This test, started in 1941, reached a depth of 7305 feet with no shows reported.

Tests Total 189

According to official reports, there have been 189 tests for oil drilled in the State of Victoria—129 by the government and 69 by private companies. Thirty-four of these tests reported shows of oil—mostly in the Lakes Entrance area. Total footage drilled is reported as 182,610 feet—94,849 feet by the government and 87,761 feet by private companies.

Most of the tests have been shallow, 105 having been drilled to depths of less than 1000 feet.

Private Enterprise Plans

In 1936, 4 completions were recorded. Since that time the completions are as follows: 5 in 1937, 7 in 1938, 9 in 1939 and 1940, 4 in 1941 and 2 in 1942. Because of war conditions no drilling was conducted in the 1943-45 period. However, private enterprises now are making plans to renew the search for oil in Victoria.

Oil Drilling Operations in State of Victoria

	EAST GIPPSLAND AREA			WESTERN AREA			TOTAL FOR STATE		
	Government	Private	Total	Government	Private	Total	Government	Private	Total
Tests Drilled	101	52	153	28	17	45	129	69	189
Tests Reaching Bedrock	14	16	30	..	4	4	14	20	34
Tests Showing Oil	5	29	34	...	...	...	5	29	34
Footage Drilled	78,982	74,028	153,010	15,867	13,773	29,600	94,849	87,761	182,610
Tests Drilled Less That 1000 Feet	69	5	74	24	7	31	93	12	105
Tests Drilled Over 1000 Feet	34	46	80	4	5	9	38	51	89
Tests Drilled Over 2000 Feet	5	4	9	2	1	3	7	5	12
Tests Drilled Over 3000 Feet	5	1	6	.....	.....	.....	5	1	6
Tests Drilled Over 4000 Feet	1	.....	1	.....	.....	.....	1	.....	1
Tests Drilled Over 7000 Feet	.....	.....	.....	1	.....	1	1	.....	1

Drilling By Districts in Victoria

DISTRICT	Number of Tests Drilled To End of 1945	Year First Test Was Completed	Depth of Deepest Test	Remarks
Lakes Entrance				
Colquhoun	50	1924	3400	Site of only production.
Colquhoun North	1	1929	660	No shows.
Metung				
Bumberrah	1	1931	1226	No shows.
Point Addis	4	1929	2740	Some shows of oil.
Bengworden				
Coongulmerang	5	1933	1286	No shows.
Moormurng	1	1932	1022	No shows.
Meerlieu	1	1936	1280	No shows.
Bengworden	5	1932	4004	Jurassic bedrock at 3940 feet.
Goon Nure	2	1931	3246	Jurassic bedrock at 3158 feet.
Bairnsdale	5	1927	1552	No shows.
Boole Poole	2	1939	3111	Jurassic bedrock at 2966 feet.
Longford				
Coolungoolun	7	1923	368	Shallow tests, no shows.
Glencoe South	5	1923	923	No shows.
Glencoe	10	1924	1406	No shows.
Stradbroke	16	1919	1521	No shows.
Wulla Wullock	2	1923	1420	No shows.
Glenelg				
Glenelg	2	1939	7305	No shows, deepest test drilled.
Portland				
Portland	3	1894	2265	Earliest drilling recorded, no Shows.
Torquey				
Jan Juc	5	1923	1453	Jurassic bedrock at 694 feet.
Nepean				
Nepean	1	1910	1696	No shows.
Dartmoor				
Dartmoor	24	1926	564	Shallow tests, no shows.
Nuntin				
Nuntin	2	1927	3560	Jurassic bedrock at 3480 feet.
Dulungalong				
Dulungalong	2	1937	2220	No shows.
Lake Boga				
Lake Boga	6	1939	906	Granite bedrock at 631 feet.
Seaspray				
Gifford	14	1925	624	No shows.
Stratford	1	1936	665	No shows.
Other Areas				
Bundalaguah	3	1938	659	No shows.
Darriman	4	1919	1250	No shows.
Nindoo	1	1936	533	No shows.
Seacombe	1	1937	1570	No shows.
Woodside	7	1919	342	Shallow area, no shows.
Wurruk Wurruk	1	1941	3214	Jurrasic bedrock at 3156 feet.
Wy Yung	2	1938	330	Shallow area, no shows.
Yerrung	1	1936	1345	No shows.
Palpara	1	....	1000	No records available.
Bolwarrah	1	1942	1255	No shows.

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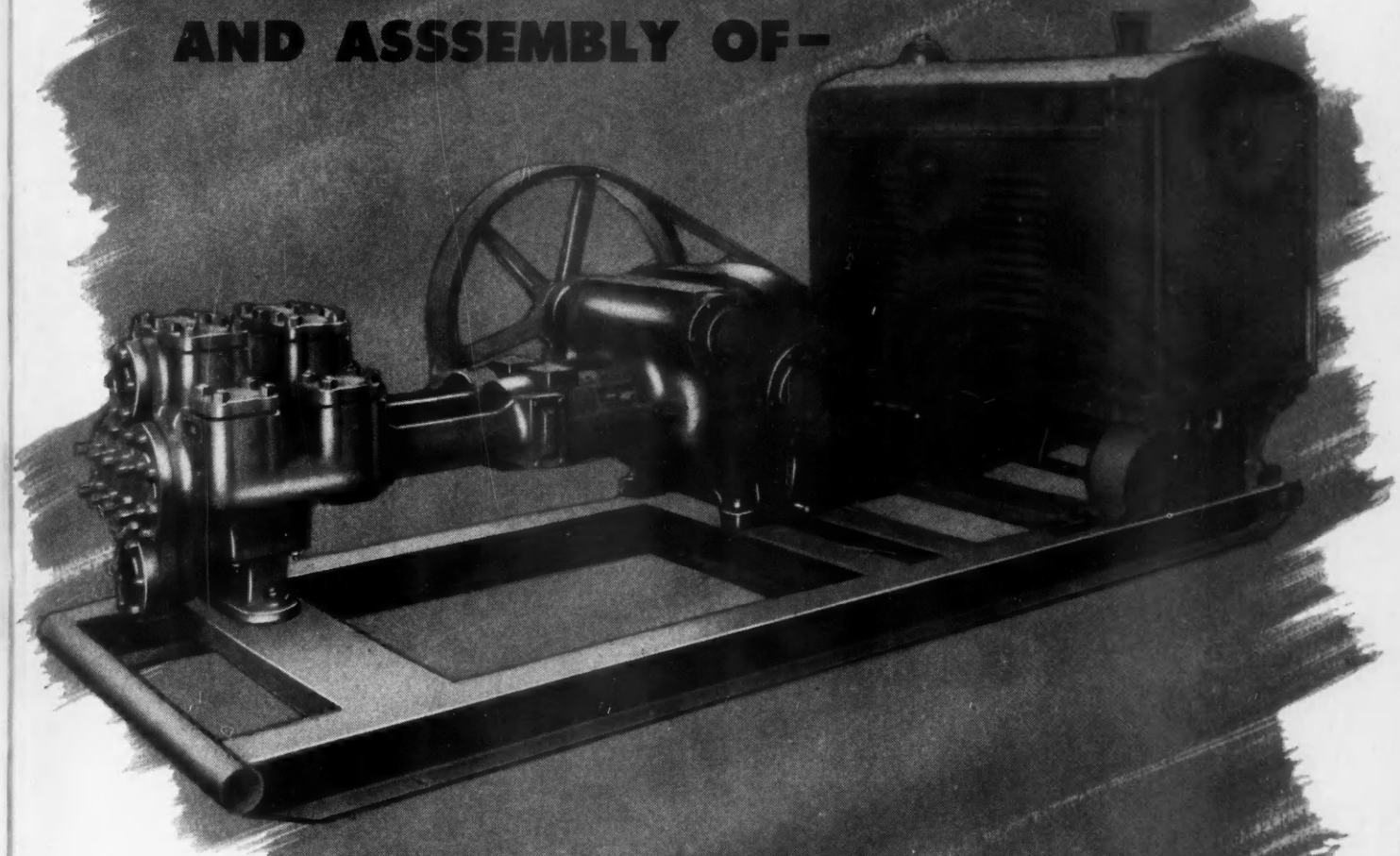

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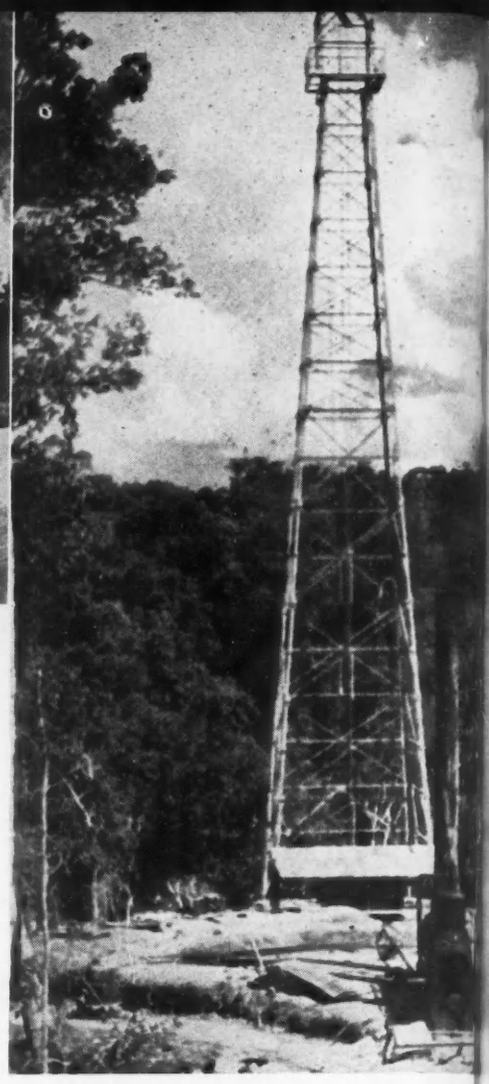

Exploration IN THE Peruvian Montaña

By LAWRENCE RAVITZ

EXTENSIVE exploratory studies in the Peruvian montaña are being carried out by three major oil companies—International Petroleum Company, Standard Oil Company (New Jersey) affiliate; Shell and Socony-Vacuum Oil Company. The only oil actually flowing from the Selva is that produced by the petroleum pioneer of the region, Compania de Petroleo Ganso Azul, Ltda., at its concession at Agua Caliente on the Pachitea River.

The three major petroleum organizations are devoting considerable personnel and funds to the early program of geological analysis and mapping of the more promising jungle regions. Actual drilling operations and large-scale exploitation, however, await the determination of the attitude of the Peruvian government toward foreign oil concessions. Until the passage of a new and favorable basic oil law for Peru, now under discussion in the national Congress, the big companies are not committing themselves to the risk of oil ventures in the montaña and are keeping their activities within the scope of preliminary surface exploration.

The presence of the companies in the Selva is far from legally defined. Although they have been granted no positive rights in the montaña, neither has the government taken steps to discourage their explorations. There are reports, however, that IPC has actually been closing land purchase transactions in the montaña.

From the standpoints of both personnel and equipment, IPC currently is the most active company in the field, with Socony-Vacuum second and Shell third. IPC already has established facilities at Talara on the coast, its equipment including a B-23 plane for flights between the coast and the montaña and an amphibian for aerial photography work and for supplying survey parties along the jungle rivers. IPC also has a sizable fleet of launches carrying survey parties, these launches being refueled at points along the rivers where oil and gas supplies have been deposited with local agents. The Shell company, which is not particularly interested in the region directly around Iquitos, reportedly has the best and most complete equipment for surveying and geographic mapping of points from land.

Although each of the oil companies has dispatched its own group of experts into the field, an unusual pattern of cooperation among the companies has developed. This cooperation is really in the nature of mutual aid in an isolated region where there are shortages of materials and facilities.

In Pucallpa, for example, the oil companies several months ago jointly purchased a two-story building, the finest in town and formerly the best hotel, to be used by their personnel. One person frequently is selected to serve as administrative and business agent for several oil companies. E. J. Aish, agent for Ganso Azul at Pucallpa, acts in the same capacity for International Petroleum. John W. Massey, head of Booth & Company's office in Iquitos, is agent for Ganso Azul, International Petroleum, Shell and Socony-Vacuum. This kind of pooling of aid among the companies is possible only during the preliminary exploratory and the pattern probably will change into one of competition when drilling begins.

Unless petroleum reserves are ample enough to be tapped at a rapid rate for many years, they will not justify the expense of difficult jungle drilling operations and costly transportation out of the montaña.

Assuming that favorable results are had, the principal problem facing the oil companies then is transportation. East or west, the journey of montaña oil to the sea would be long and expensive. Eastward, the trip down the Amazon probably would lift costs beyond competitive levels of other oil-producing countries. Westward, the Andes would have to be hurdled. Estimates of the cost of building a pipe line across the mountains to the coast range around $30 million. The high expense and the great technical difficulties mark the enterprise as a considerable risk for any one company.

That oil in the montaña is a reality—at least at one place—has been amply proved by Ganso Azul Company, the only firm actually producing and marketing petroleum products in the upper Amazon basin. During some seven years

At top of page, left: Supply truck on central highway of Peru, mountain section between Huanuco and Tingo Maria.

Right: Derrick of Ganso Azul's latest well, No. 7, which came in as a producer last September.

Ferrying trucks across the San Alejandro River on the Central Highway to Pucallpa (lowland section between Cordellera Azul and Ucayali River).

of commercial operations, Ganso Azul has had considerable impact on the life of the region. Kerosine lamps now light jungle huts along the rivers, and residual fuel oil is the source of electric light for the city of Iquitos.

Ganso Azul's latest well, No. 7, struck oil on September 16—the first successful well drilled since 1941. It was reported to have been brought in at a rate of 3700 barrels daily, although today it flows considerably less. Drilling on No. 8 is already underway.

Only two of the first six wells on Ganso Azul's 90,000-acre concession on the Pachitea River were successfully completed. Those two, plus No. 7, account for Ganso Azul production today. For drilling operations a 122-foot derrick and steam-powered rotary rig is used.

Company Facilities

Ganso Azul production facilities at the Agua Caliente concession are split into two main divisions. The "port" area includes a refinery, storage tanks and equipment for transferring oil products to barges. Four kilometers from the port is "La Cumbre," atop a dome rising several hundred feet above the surrounding jungle. At La Cumbre are the producing wells, the administrative headquarters of the concession, living quarters for technical and supervisory personnel, a small dispensary, a well-equipped machine shop, and radio equipment for communication with Lima and Iquitos.

Crude oil from La Cumbre travels through pipe line to the port refinery, a straight-run distillation type, comprising five shell stills capable of processing 400 barrels a day. The Ganso Azul oil is of high quality, better than most California oil and as good as Texas and Pennsylvania oil. It has a high paraffin base content of 7 percent and low sulphur content—only one-tenth of one percent.

Distillation in the Ganso Azul refinery breaks down as follows: 35 percent gasoline, 35 percent residual or fuel oil, 19 percent diesel oil and 11 percent kerosine. Two grades of gasoline are marketed—white and ethyl. The company's ethyl blending plant was installed by the Ethyl Corporation.

Residual oil is stored in an open sump with a capacity of 20,000 barrels. Other products are stored in a series of tanks with a total capacity of about 12,000 barrels.

The working force at the Agua Caliente port and at La Cumbre comprises approximately 10 technical and supervisory personnel and 125 laborers and foremen. Houses of native jungle type are provided free for workers with families, and dormitories are available for single workers. The company provides commissaries and medical service and has also established schools for workers' children, one at the port and one at La Cumbre.

The Ganso Azul company's market is primarily downriver at Iquitos. Its fleet includes six tugs, four twin-engine and two single-engine; three large barges each with a bulk capacity of 126,000 gallons; 10 barges of 15,000 gallons capacity each; and 10 wooden barges for barreled deck cargo. Marine operations, centralized at Iquitos, are under the supervision of a former commander in the Peruvian Navy.

Markets Expanded

The Ganso Azul company has yearly expanded its Amazon basin markets until it now sells some 242,000 gallons of petroleum products monthly throughout the montaña region and does an annual business of approximately $250,000. Its major sales are in Iquitos although the company is beginning to extend its marketing activities down the Amazon to Manaos, Brazil, where it is considering the establishment of a refinery jointly with Brazilian interests.

Next to the Agua Caliente concession, the heaviest concentration of Ganso Azul capital is at the big distribution points of Pucallpa and Iquitos. At Pucallpa company equipment includes one 1500-barrel storage tank, two 1000-barrel, and one 500-barrel tank. Another storage tank is being installed and a retaining wall to protect the tank area from the river during its period of rise is being built.

At Iquitos storage facilities include four 1500-barrel tanks and two 1000-barrel tanks. The company's can manufacturing plant also is located here as are a well-equipped woodworking shop for the manufacture of wooden cases for packing oil cans.

An American expert sent down by the Pasadena, Calif., investment corporation which controls the Ganso Azul company, has been studying the operations of the company and his report, expected shortly, may indicate certain organizational and operational changes. Among the possibilities are the removal of the transportation office and the woodworking and canning plants from Iquitos to the Agua Caliente concession, and establishment by Ganso Azul of its own sales office in Iquitos to replace the present agency arrangement.

Government to Drill

Activities of two other organizations complete the picture of oil activities in eastern Peru. Compania Peruana de Petroleo El Oriente is preparing to begin drilling operations at its site at Puerto Oriente near Contamana on the Ucayali River. This company reportedly has acquired modern drilling equipment and actual drilling should soon be in progress.

The Peruvian government, through its Bureau of Mines, is preparing to drill at Santa Clara near Orellana on the Ucayali. Although drilling equipment has been brought into Santa Clara, reports indicate that progress on this project has been slow.

Trinidad Fields Normal Again

Report From London

By
E. N. TIRATSOO
Staff Writer for
The Oil Weekly

THE London office of the Trinidad oil companies has announced that damage to installations and oil stocks during the recent disturbances in Trinidad totaled £6000 ($25,000). The labor situation is now nearly normal, and conditions in the oilfields are generally quiet.

The strike was instigated by a recently registered Union of miscellaneous workers (The British Imperial Workers' Peasant and Ratepayers' Association), in an attempt to usurp the position of the Oilfield Workers Trade Union, long recognized as representing oil workers.

The Oilfield Workers' Trade Union (with which the Trinidad oil industry has had relations for about nine years, and has current agreements in force for another year), throughout the strike advised its members to remain at work and abide by the terms of its agreements.

Two United British Oilfields of Trinidad, Ltd., oil wells were set on fire during the disturbance, but the fires were extinguished within a few days. Several small field tanks, also set on fire, likewise were quickly extinguished, and the actual loss of oil was comparatively small. Production of oil by United British Oilfields over the six-week period was 12 percent below normal.

Some 500 barrels of oil and a number of tanks were destroyed by fire January 21 in the area of the Trinidad Petroleum Development Company. However, latest information is that conditions in Port of Spain are almost normal, and no further oil-field sabotage has been reported. At the peak of the strike 1470 workers out of 11,340 were out.

No Australian Oil Despite Intense Search

No oil or gas was discovered in Australia during 1946 despite exploratory activities by The Caltex Company in the Kimberley district of Western Australia, and Freney Oil and Lakes Oil, Ltd.

New refineries erected include the Vacuum Oil plant at Paisley, Victoria, and the Caltex subsidiary plant at Sydney, New South Wales.

National Oil Ltd. during 1946 produced 4 million gallons of gasoline by distillation of New South Wales shales and this production is expected to be doubled in 1947.

The Commonwealth Bureau of Mineral Resources has announced the immediate start of a geophysical survey of the country northwest of Broken Hill. Natural gas deposits, particularly, are being sought.

Italy Restores War-Damaged Areas

Oil fields of Piacenza and Parma have been extensively repaired of their war damage, and are now producing 1500 metric tons (11,470 barrels) of crude oil a month. The Pietra Mala fields are yielding only 1000 metric tons (7650 barrels) a year, but having been relinked with Florence by natural gas pipe line, are supplying considerable quantities of methane gas for heating purposes. Plans also are afoot to connect the Pietramala district with Rome by another pipe line. Present production in the Ripi district is 200 tons (1530 barrels) a month, but this output soon is expected to be increased. Another area that promises large future developments is the Lodi region, where natural gas was found in large quantities at 4300 feet and oil at 8900 feet in a well drilled in 1944.

Personals

William Richardson, executive secretary of the Petroleum Board's Overseas Supply Committee has been appointed an Officer of the Order of the British Empire (OBE) in recognition of his long services.

C. G. Johnstone has been elected a director of Trinidad Leaseholds, with the title of overseas director. He will also be president and associate managing director of the Good Rich Refinery Company of Toronto and Port Credit which has recently been purchased by Leaseholds. R. Rosefield, who founded Good Rich 12 years ago, will remain as associate managing director in charge of marketing and sales.

Gilbert C. Whigham has resigned from the board of Anglo-Iranian, and Sir Kenneth Harper, a director of Burmah Oil Company, has been elected in his place.

H. D. Demoulins has been named a director of Anglo-American Oil Company in charge of refinery operations. He has been associated with the Anglo-American group since 1920.

Pipe Line Links Elbe With Danube

Plans are being worked out in Prague to make use of the 8⅝-inch pipe line built during the war which links the petroleum docks at Vienna with the town of Raudnitz in Bohemia on the Elbe. The line runs via Znojmo, Jihlava and Kolin, 162 miles of it being in Czechoslovakia and 38 miles in Austria. It has not been used previously because of the absence of pumping stations, but if it can now be utilized, there will be a substantial reduction in the cost of Roumanian oil supplies sent up the Danube to Vienna and thence to Czechoslovakia.

New Exploration Concession for D'Arcy

D'Arcy Exploration Company Ltd., Anglo-Iranian's exploratory subsidiary, has been granted a prospect license by the Minister of Fuel covering an area of approximately 142 square miles in the counties of Derby, Leicester and Stafford, centering round the towns of Burton-upon-Trent and Ashby-de-la-Zouche.

New Hungarian Natural Gas Line

The pipe line from Lispe to Budapest is expected to be completed this spring. The capacity of this line will be about 7 million cubic feet of natural gas daily, and the cost of gas in Budapest, it is expected, will be reduced by 30 percent. Construction of this line is part of a long-term plan for wider Hungarian exploitation of the gas resources of Trans-Danubia.

Australia Continues Papua Oil Search

Australasian Petroleum Company, in which Anglo-Iranian and Vacuum Oil have large interests, commenced cleaning out the Kariava well in October after rehabilitating the equipment. By the end of 1946 the shut-down depth of 5400 feet had been passed, the condition of the hole being excellent. An extensive program of geological and geophysical exploration, including aerial surveys, will be followed by an active drilling campaign. Two additional rigs are on order. There are abundant oil seepages and gas shows in Papua.

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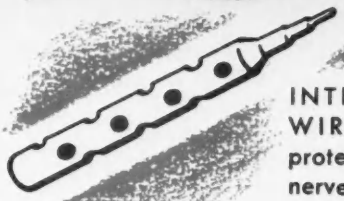
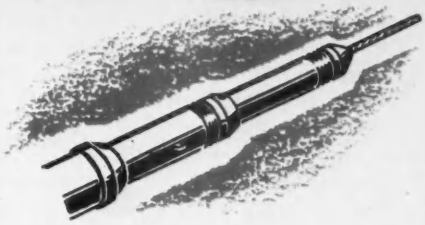
GUN - BODY



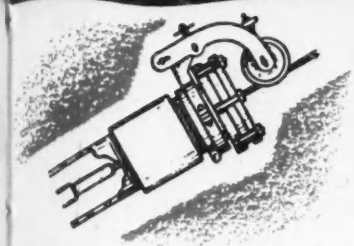
INTERNAL WIRING — protects the nerve center against operational accidents — assures against misfires or twin firing through electrical shorts caused by abrasion or possible electrolytic action of well fluid.

PULL-OUT CABLE HEAD



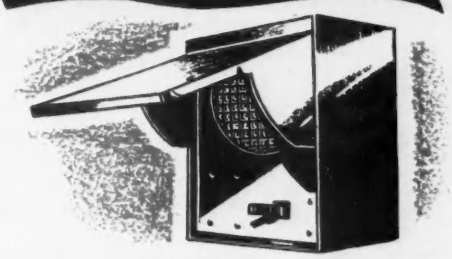
PULL-OUT CABLE HEAD — releases the gun at predetermined tension to avoid expensive wire line fishing jobs, leaves a clean fish.

BLOWOUT PREVENTER



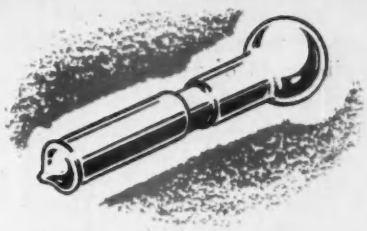
BLOWOUT PREVENTER — permits operations to be completed against pressures. Well is controlled at all times.

RIG SPEAKER



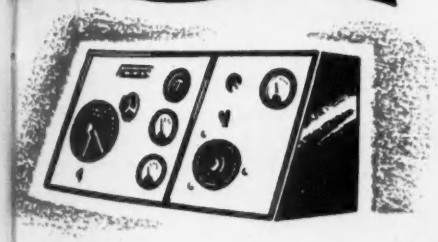
TWO-WAY COMMUNICATION — permits Lane-Wells operator, in truck, and rig man to be in contact at all times.

SAFETY SWITCH



SAFETY SWITCH — on Rig Floor — protects the rig man and crew while the gun is out of the hole.

CONTROL PANEL



CONTROL PANEL — carries four independent switches that must be operated in the proper sequence before the gun is fired.

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Billion and Half Barrels of Reserves Added by Completion of Abqaiq No. 10

Completion of Abqaiq 10, in the Abqaiq field in Saudi Arabia has added at least a billion and a half barrels to the reserves in this field, according to company officials. No. 10 is only slightly more than 2 miles west of the nearest previous production, but its completion resulted in revisions of original ideas on the productive zone in the field.

The well reported 220 feet of limestone pay with 22 percent porosity, and flowed at the rate of 11,000 barrels per day in a test to determine not only production potential but possible presence of water. The heavy flow showed not the slightest indication of water.

Reserves proven by the drill in Saudi Arabia, on the properties of Arabian American Oil Company (the country's only producer) are now set as follows:

Abqaiq	5,000,000,000 bbls.
Dammam	600.000,000 bbls.
Qatif	50,000,000 bbls.
Abu Hadriya	140,000,000 bbls.
TOTAL	5,790,000,000 bbls.

However, in the instance of all of the fields, the reserves will unquestionably be greater than is indicated in the table. A well drilling at North Abqaiq, between Abqaiq and Qatif, which has been considered as a separate structure, is proving very interesting and it is considered possible that Abqaiq and Nort Abqaiq may turn out to be one structure.

State Department Wants Russian Order Honored

State Department officials are making a fight to have Russia's order for some $25 million worth of industrial equipment, approximately half of it in the form of petroleum refinery machinery, honored as an international obligation over the opposition of the Senate Appropriations Committee.

The matter come out into the open (THE OIL WEEKLY, Feb. 10) when it was disclosed that Comptroller General Lindsay Warren had refused to approve the expenditure of shipping charges and had raised the question whether the deal might not contravene the provisions of the lend-lease liquidation act.

The position of the department was made known to the committee by Secretary Marshall's office, where it was stated the department felt such orders constitute international agreements "which must be fulfilled regardless of the fact that Congress has prohibited further expenditures for transportation, insurance and other administrative costs."

The department also made its position known to the Russians in the news commentary on its first day's broadcasting program beamed at the Soviet Union in the Russian language.

Ten Million Barrels for Nederlands East Indies

Production in the Nederlands East Indies during 1946 is estimated at 1,300,000 metric tons (about 10 million barrels).

Tarakan Island, off Dutch Borneo, now is producing about 4000 barrels of oil daily, about one third of its prewar output. Since the liberation of the island some 1,150,000 barrels of oil have been shipped.

Production in British Borneo during 1946 is estimated at 3,500,000 barrels.

Egyptian Officials Visit

Egyptian government and oil company officials were in Houston last week inspecting oil fields and recent developments in oil field equipment.

The party included Hanifi Bey and Izzat Bey, representatives of the Egyptian government, and Aboul Ezz Bey, representative of Socony-Vacuum Oil Company in Egypt. They had been in California before coming to Texas.

Inspection of Sumatra Fields Is Refinery Key

The date when oil refining operations in Sumatra will resume hinges upon how soon it will be possible to re-enter and inspect the producing fields, Edward N. Leibacher, general manager of Nederlandsche Koloniale Petroleum Maatschappij, East Indies affiliate of Standard-Vacuum Oil Company, declared recently on his arrival in The Hague from the United States.

Leibacher, en route to Batavia, expressed hope that technicians of NKPM will soon be able to visit the company's South Sumatra oil fields. So far, company representatives have not been able to inspect the oil fields to determine their condition after having been in Japanese hands during the war.

The company's Soengei Gerong refinery near Palembang suffered major damage during the war but repairs are now being made. However, complete rehabilitation of the refinery must await the arrival of special equipment from the United States. It may also be necessary to make major repairs and replacements to the pipe line from the oil fields to the refinery, a distance of some 85 miles.

Peru Production

Crude oil production in Peru during 1946 totaled 12,455,991 barrels, a decline of 9.4 percent from the 1945 output of 13,748,228 barrels. Natural gasoline production was 1,041,536 barrels, a drop of 3.9 percent from the 1,075,137 barrels produced the preceding year.

State Department Offers Assistance To Small Companies for Yemen Work

Reports attributed to the United States State Department say the department has offered smaller oil companies the same assurances of limited assistance in obtaining oil concessions in the Middle East as is now at the disposal of the larger operators. This announcement came as it was reported that several smaller concerns have shown an interest in obtaining exploration rights in Yemen, a small country at the southwest corner of the Arabian Peninsula on the Red Sea.

The existence of oil seepages along the Red Sea have contributed to the interest in the country as possible oil territory, and department officials estimate that inasmuch as no part of the country is under concession, it might be possible for interested independents to enter the country, make surveys, and carry on some drilling, for as little as $2 million.

However, the department has made it clear that its Near East division's policy is to do no more than furnish information to all companies interested in sections not under concession. Final contracts are up to the American firms and the governments of the countries themselves.

It is said that until a presidential mission entered Yemen in 1946, there had been only seven white men enter the country, which covers an area of approximately 75,000 square miles.

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Venezuela Oil Companies Pay $166 Million in 1946

Dr. Juan Pablo Perez Alfonzo, Venezuela's Minister of Development, said in a statement released last week that Venezuela has a "reasonable" division of profits with foreign oil operators and contemplates no increase in royalties or income affecting its oil fields.

Recently, the Minister said that he considered a 50 percent participation just and equitable. The government's participation includes 16⅔ percent royalties on oil production, plus income taxes and other smaller taxes paid by operators.

Dr. Perez Alfonzo said he considered the government and private companies were in perfect accord as to the equitability of the present division of profits. He said he saw no change in the royalties law.

In 1944 oil companies paid the government approximately $74,366,000. In 1945 the payment was $127,133,000, which included an extra income tax, amounting to $29,533,000, imposed in December, 1945, after the present government came into power. Dr. Perez Alfonzo estimated the government's share in 1946 at $166,500,000.

Congress Delayed

Oil companies have been officially advised that the South American Petroleum Congress, scheduled for May 12-17 in Lima, Peru, has been postponed, and will not be held before September.

The Peruvian government has indicated that it does not consider the atmosphere propitious to hold the convention at this time.

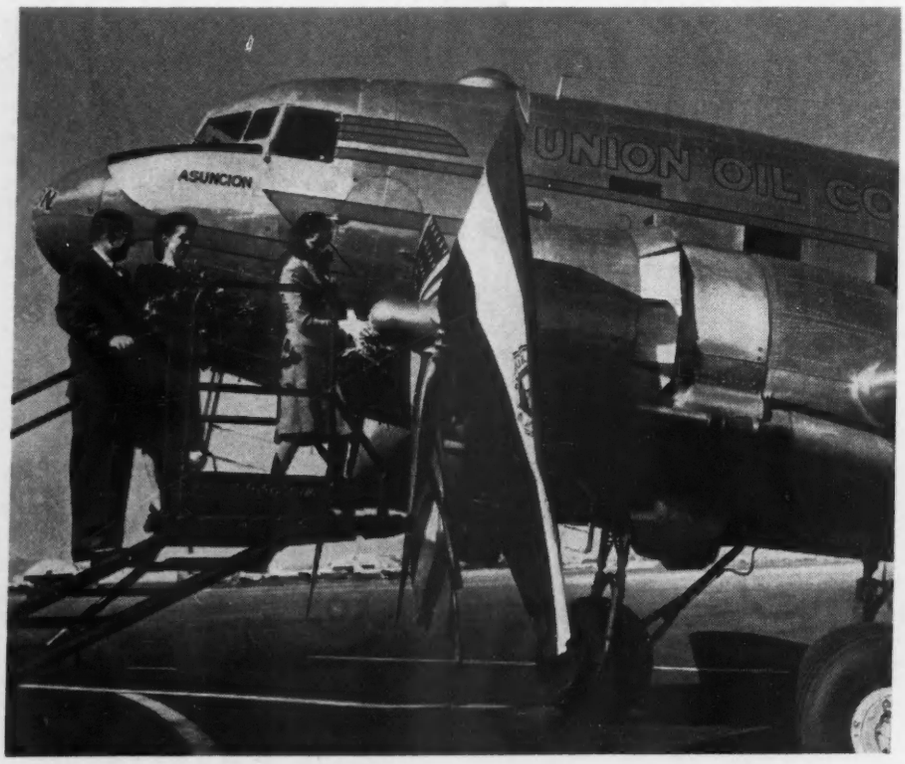
Haiti Wildcat

A wildcat test drilling in Haita by an American oil company has reached a depth of 6500 feet and continues to drill in limestone containing clay and chert, according to a report received by the Department of Commerce. Company geologists are credited with having recommended that the test be drilled to 12,000 feet.

Headquarters Moved

It is announced officially in the *Wiener Zeitung* that headquarters of the Shell Mineraloel A.G. (Royal Dutch-Shell group) have been transferred from Vienna, which is under inter-Allied control, to Salzburg in the American zone.

Wings for South America



Mrs. Juan Pedretti officially christens Union Oil Company's new DC-3, the "ASUNCION," to be used in the company's Paraguayan drilling activities, while Senora dona Maria P. de Sanchez-Albarran and A. C. Rubel, vice president of Union Oil, look on.

Scottish Oils Ltd. Plans Closing Two Shale Mines

Scottish Oils, Ltd., plans to dismantle the Hopetoun Crude Oil Works at Niddry, Winchburgh and the Deans Crude Oil Works at Livingston Station. The reason given for closing these old established centers of the Lothian shale industry is the shortage of shale oil workers. Lifting of the Essential Works Order from the Scottish shale oil industry on January

The company's West Calder mine, sunk in 1937 and one of the most up-to-date in Britain, was the scene of the worst disaster in the history of the Scottish shale when, in January, 14 miners were trapped and killed in an explosion and fire.

Anaconda May Search for Oil In British Guiana

Reports in New York indicate that Anaconda Copper Mining Company has made application for prospecting rights in undeveloped portions of British Guiana to search for minerals including oil.

Engineers are expected to move into the country for a preliminary survey within the next few months.

The country is said to be a potential source of a number of minerals in addition to gold and oil, and has produced a small amount of uranium ore.

Standard Plans Larger Refinery at Vancouver

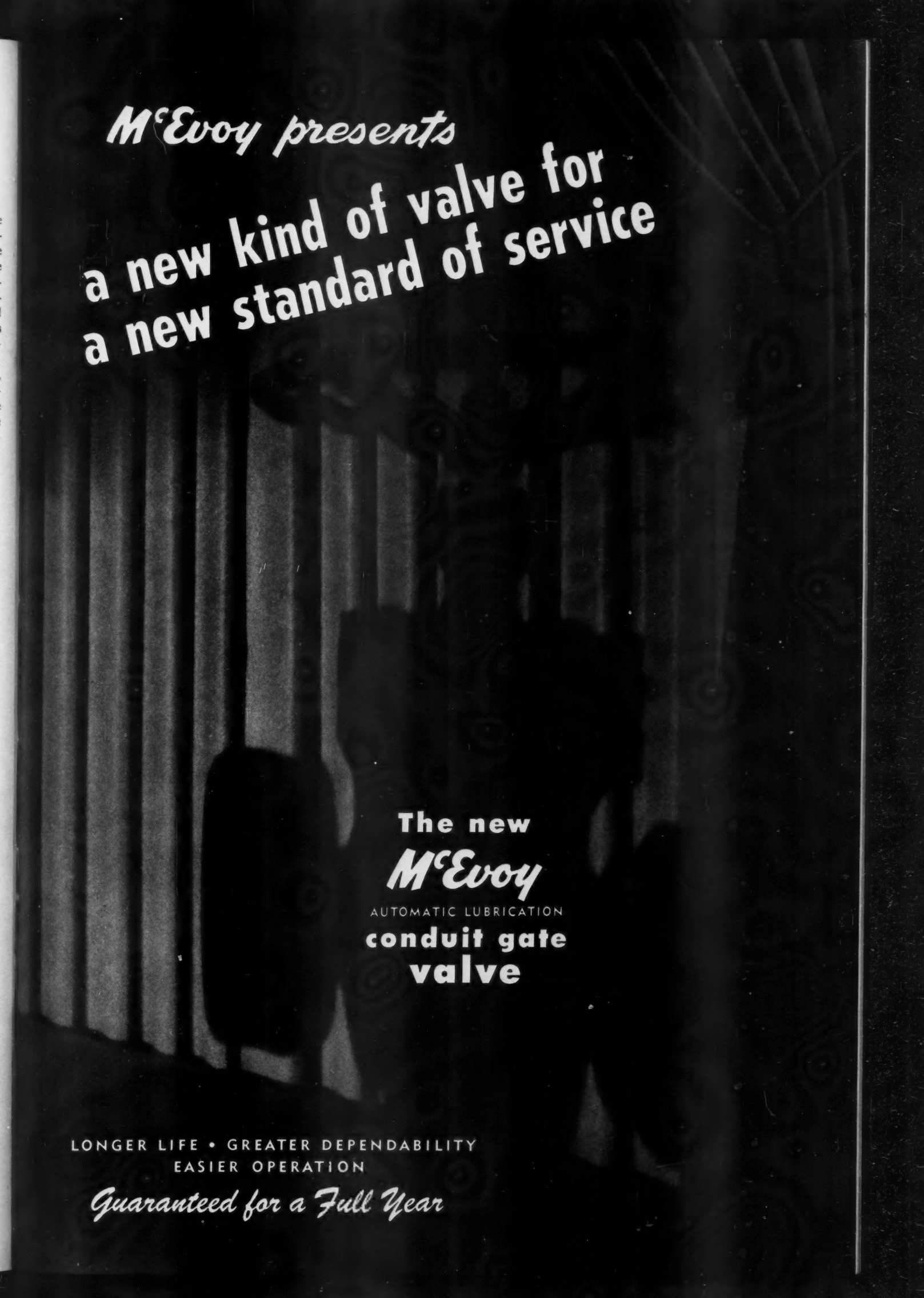
Standard Oil Company of British Colombia will enlarge its refinery at Vancouver, Canada, but definite plans for the building program have not been announced, according to Ralph G. Follis, president of Standard Oil Company of California, the parent company.

Follis stated that Standard has a big program of exploration and drilling in Alberta, Canada, during 1947 and that wells would be drilled in the southeastern Alberta region.

Imports of Petroleum for Paraguay Nearly Doubled

Imports of principal petroleum products into Paraguay last year amounted to 78,300 barrels against 46,000 barrels in 1945, and included 56,400 barrels of gasoline, 16,900 barrels of kerosine, 2300 barrels of gas oil and 2700 barrels of diesel oil.

Gasoline consumption in 1947 is expected to be 60 percent higher than in 1946.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Producing Lime Underlying Kuwait's Oil Sand Regarded as a Possibility

While it is a matter which can be determined only by the drill, the possibility of oil in the lime underlying the present producing oil sand in Kuwait is being discussed by those interested in the Middle East. Production in near-by Saudi Arabia comes from a lime formation which should be found at a greater depth than has as yet been drilled in Kuwait.

"The stratigraphic information checked leads one to think that it is entirely possible that Kuwait may be underlaid by a producing lime formation," one authority says.

Personals

John R. Suman, vice president of Standard Oil Company (New Jersey), left New York by air last week for Saudi Arabia. He is accompanied by Mrs. Suman.

P. F. Leineau has been made manager for Central Europe for Socony-Vacuum Oil Company. He is now in New York. Location of his European headquarters has not been announced.

F. F. Goodwin, warehouseman for the production department of N.K.P.M., with headquarters in Batavia, Java, left for the Netherlands East Indies on February 27. He was the first man from the production department to go from the U. S. to the N.E.I. by way of the Pacific since the war ended.

T. T. Weeks, material man for the refining division of N.K.P.M. (Standard-Vacuum) in Batavia, Java, also left at the same time.

Dallas E. McGehee, drilling foreman of Standard Oil Company of Egypt, headquarters in Cairo, has been in Houston for the past several days on business.

Copies of Senate Group Oil Investigation Ready

Extra copies of the "Final Report" of the Senate Special Committee Investigating Petroleum Resources are available at the Government Printing Office in Washington, D. C., Senator Joseph C. O'Mahoney has announced.

Among the subjects listed in the document are the necessity for petroleum, proved reserves, productive capacity, national oil policy matters, domestic oil requirements, American oil interests in foreign countries, public lands, and the independent company.

The book, containing 59 pages, is for sale at 15-cents per copy, or $64.95 per thousand for agencies interested in obtaining an additional quantity. Orders should be placed with the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Brazil Output Drops

Crude oil production in Brazil during December, 1946, amounted to 5790 barrels, bringing the country's output for the year to 67,144 barrels. The annual production compares with 79,000 barrels produced in 1945.

During December the Candeias field produced 5457 barrels from 9 wells while the Aratu field's two wells flowed 333 barrels.

Colombia Production For December Increases

Tropical Oil Company's oil production in Colombia during December, 1946, totaled 1,122,717 barrels, a sharp increase from the 588,553 barrels produced in November.

During December the company completed nine wells and drilled a total of 21,681 feet. At the end of the month six rigs were active.

Colombian Petroleum Company's output during December totaled 643,845 barrels, compared with 106,729 barrels in November.

Compania Colombian de Petroleo el Condor's production in the Casabe field in December totaled 361,200 barrels.

A nationwide oil workers' strike which affected the Barco and Casabe, particularly accounted for the small output in November.

Off for Kuwait

C. R. Whitehill of Houston, assistant to the superintendent of transportation for Gulf Oil Corporation, will leave shortly for Kuwait where he will have charge of Gulf's transportation, including garages, machine shops and road building.

Whitehill was in Mexico for 10 years with Huasteca Petroleum Company and for the past 17 years he has been with Gulf in Houston.

China Interested in 50-50 Participation Deal With Foreign Oil Corporations

A report which has reviewed the various geological reports and conclusions regarding oil in China has been completed by J. Elmer Thomas, American geologist, according to Dr. C. D. Shiah of the National Resources Commission of China. Thomas, a former president of the American Association of Petroleum Geologists, is a consulting geologist of New York and Fort Worth, Texas, whose work has involved studies of foreign as well as domestic operations and who has made a particular study of the economics of oil operations abroad.

According to Dr. Shiah, operations in China during the past year have not showed an increase over the previous year, due to difficulties in receiving equipment. The single commercially producing oil field, in Yumen Province, is currently producing about 1200 barrels per day from 20 flowing wells. No wells were drilled in the field during 1946.

At the present time, Dr. Shiah said, the Chinese government is interested in negotiating with foreign oil companies on a basis of a 50-50 participation in such projects by the Chinese government. He said that it was not the policy of the government to grant a monopoly concession covering China but that it was possible to negotiate on definite areas. Any change in policy, he said, would likely be predicated on passage of a petroleum law. He did not indicate that he thought such a change probable at this time.

The Chinese government is now operating a 15,000-barrel refinery on Formosa, formerly owned by the Japanese. Oil for the refinery is being purchased from Anglo-Iranian Oil Company.

Oil Field Fire Fighting Group Asks for Charter

A group of oil companies and drilling contractors has organized Well Protection Company, Inc., as a cooperative fire-fighting organization for the industry. The concern applied February 25 for its charter in Texas.

The organization is the result of the work of a committee study that has been under way during the past year. Now, with organization work completed, other companies, both large and small, will be given an opportunity to participate.

Claude Parsons, who headed the organization committee, has been elected president of the new company, which will establish headquarters in Houston. Myron M. Kinley is vice president, and W. W. Flenniken, secretary-treasurer, of Well Protection Company, Inc.

Plans call for the company to maintain specialized oil well fire fighting equipment ready for service. This specialized equipment will be established first in Houston, and later in other oil centers.

The company also plans to provide a training program, so that the industry will have a number of men trained in this work. Arrangements will be made whereby oil company men may participate in this training program, with the understanding that they will be called on when needed in case of fire. This will make is possible to have trained crews available for service in all areas.

In addition, it is planned to catalog all equipment owned by companies, such as tractors, that might be of service in case of fire, so that such units could be made available quickly.

The company will employ a full-time engineer, who will make time studies, investigate causes of blowouts, and make complete reports, thus setting up an experience record for the industry.

Waltman Succeeds Haslam On Public Relations Group

Plans for making available to all branches of the oil business booklets, slide films, and other material which will best tell its story were drawn up at a meeting of the industry's public relations operating committee in Chicago last week.

The Fred Eldean Organization, public relations counsel, reported progress in organizing district committees in PAW Districts 2, 3, and 4, the last at a Denver meeting Wednesday. District 1 also is being organized in New York. Program presentations have been made to 19 trade associations and industry groups.

Franklyn Waltman, of Philadelphia, director of public relations for Sun Oil Company, who presided, was elected to the chairmanship previously held by Robert T. Haslam, of Standard Oil Company (New Jersey), who resigned because of ill health. Three new vice chairmen will serve along with Ralph Champlin, New York, of The Ethyl Corporation, as follows: Edgar A. Waite, San Francisco, of Standard Oil Company of California; North Bigbee, Dallas, the Texas Mid-Continent Oil and Gas Association, and Conger Reynolds, Chicago, of Standard Oil Company (Indiana).

The committee will meet next in San Francisco on April 1 and 2.

Figure 1. Hood which is easily thrown back, protects this light, easily handled cart from weather. Rectangular base protects lower edges of unit.

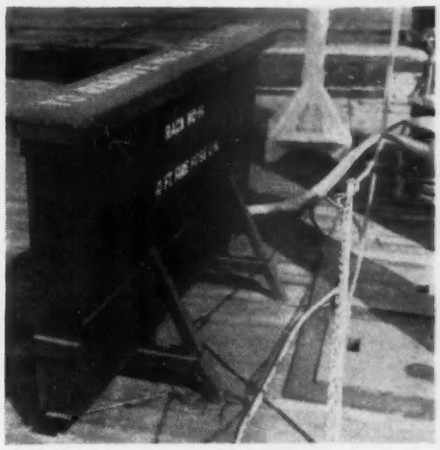

Figure 2. When friction-tight lid on this container is thrown back, front panel drops away by its own weight, exposing hose nozzle. Narrow box guides hose when pulled out rapidly.

Fire Hose Racks

Feature Portability, Accessibility

ESTABLISHMENT of an effective fire-fighting system for the equipment yard may be accomplished easily in the manner used by one company. Instead of depending upon fixed, more or less permanent installations of fire hoses, two types of portable or movable installations were built, using existing shop facilities for the most part.

The smaller size and relative inexpensiveness of the units made it possible to use more of them, spotted in strategic spots. Also, hose lengths could be modified to suit the local conditions.

One of the types is a small cart made of used piping which in some respects resembles a conventional fire hose cart. The difference is that the cart is small and is provided with an oval-shaped sheet steel hood, designed to fit closely about the cart and to rest on short legs above a rectangular base of angle iron as shown in Figure 1. The hood, when placed over the cart, effectively protects the latter from weather, the angle iron base giving a measure of protection to the siding when in the closed position. The cart handle rests on the ground or floor inside the enclosure. When a fire occurs, the hood is thrown up and back, using a convenient handle installed on the side of the hood. The cart handle is picked up and the unit then is ready to be pulled toward the hydrant nearest the fire, connected, then pulled to the scene of the fire.

Collapsible Hose Rack

The second type of hose container is not as portable as the above-described unit, but may be carried to any desired spot with little difficulty. This rack, made of 1x6-inch lumber and supported in an upright position on two cradles of 2x4-inch material, is a self-locking enclosure, utilizing no hasps or pins which might in some way confuse or delay the man trying to get at the hose. Shown in Figure 2, the narrow rectangular box has its opening on one end, this panel being held at the bottom with a large strap hinge. The cover is a removable section which rests atop the box and is secured there by the friction of a fairly tight fit on all sides, including the end panel when the latter is in the closed position. The hose is stored in layers, the nozzle end on top and accessible at the front end. While the hydrant connection projects through the lower, rear end of the box.

In event of a fire, the friction-tight cover is thrown back. This action causes the front panel to fall outward by its own, unbalanced weight, exposing the nozzle and hose. The man can run with his end of the hose, knowing it will unfold or pay out of the rack in an orderly manner, even though he may turn several corners before reaching the scene of the blaze. This type of rack is suitable for the more centrally located positions of the yard, and while it is not portable, it is movable to a degree, to suit the local space conditions. It is weather-tight and inexpensive to build and to keep in serviceable condition.

All racks, portable or stationary, are painted a brilliant red, and in most instances, the length and size hose are painted in white letters on the side, telling at a glance whether a particular unit would reach the scene of the fire.

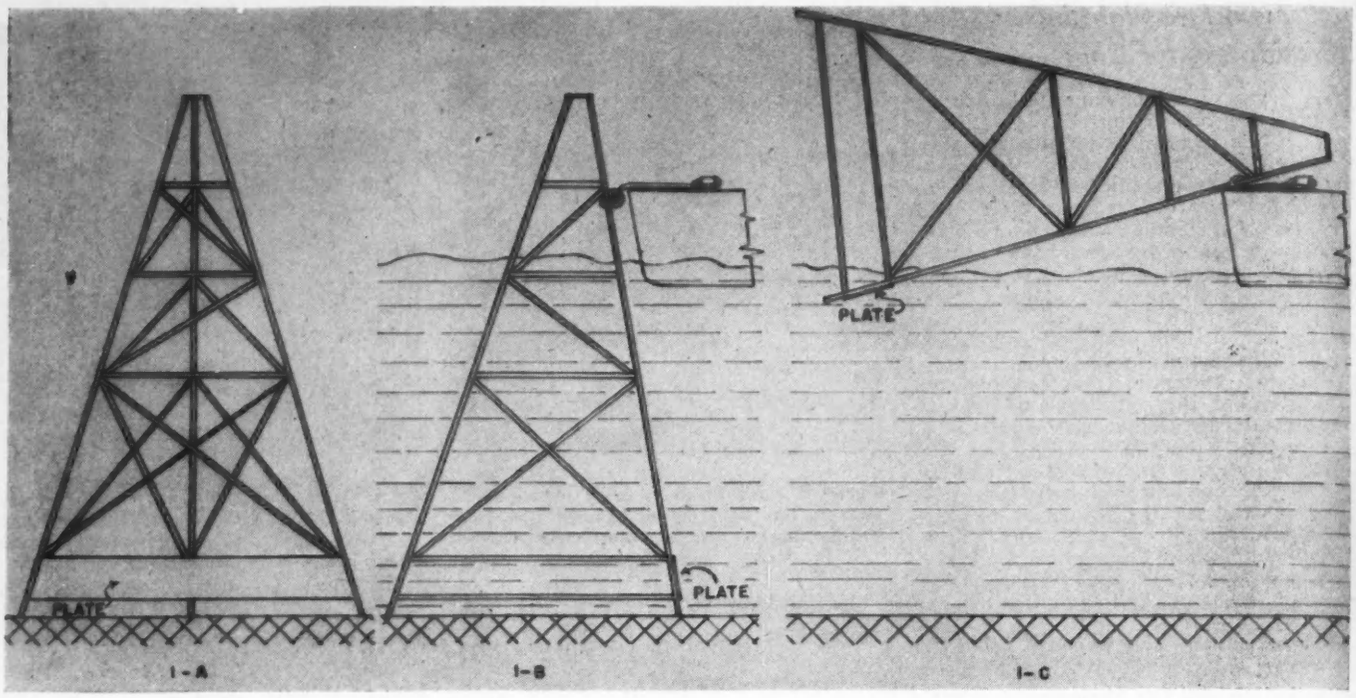

Figure 1. A—Tripod for water gravimetric survey. B—Tripod attached to boat prior to being towed. C—Tripod being towed by boat.

Unique Tripod

Speeds Water Gravimetric Survey

By S. W. WOODARD

Gravimetric Supervisor, Universal Exploration Company

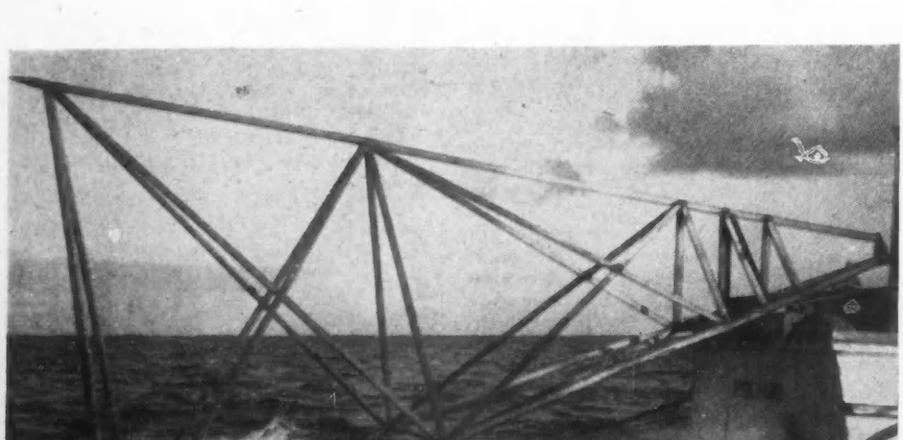

Figure 2. Tripod being towed to a location to take gravimetric reading.

A TRIPOD* enabling gravimetric readings to be taken at a relatively high rate of speed on a water survey has been developed and is being used in the Bahama Islands.

The tripod and method of use are illustrated in Figure 1. A plate is attached across two legs near the bottom (Figure 1-A). When this device is to be moved, the two legs across which the plate is attached are fastened near the top to the stern of a boat by means of rope or cable (Figure 1-B). The boat then moves forward and the top of the tripod is pulled over and comes to rest on the boat stern. The force of the water on the plate causes the bottom of the tripod to rise near the water surface and the tripod is towed in the manner indicated in Figure 1-C. When a new location is reached, the boat is stopped and the lower end of the tripod sinks to bottom. The boat is then backed up, pushing the tripod into upright position.

Three-Man Crew

In Figure 2, one of the tripods being used in the Bahamas (Figure 3) is being towed to a location. In Figure 4 the tripod is being pushed into upright position, and in Figure 5 a gravimetric reading is being taken. As shown in Figure 5, a crew of three men is on the tripod while the meter is being read. The crew includes the meter man, a second man who carries the meter on his back from and to the boat, and a third who facilitates the operation in various ways.

The tripod shown in Figures 2 to 5 is approximately 17 feet high. It has been used in wind up to 15 miles an hour without any important decrease in the speed of operations. It has been used successfully in wind up to 20 miles an

* Patent pending.

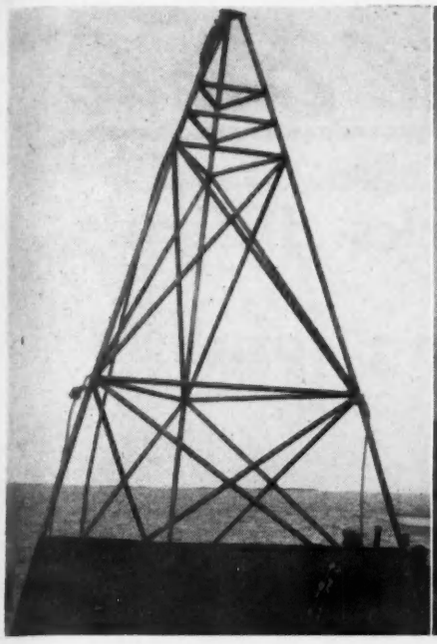

Figure 3. Seventeen-foot Tripod being used on gravimetric survey in Bahamas.

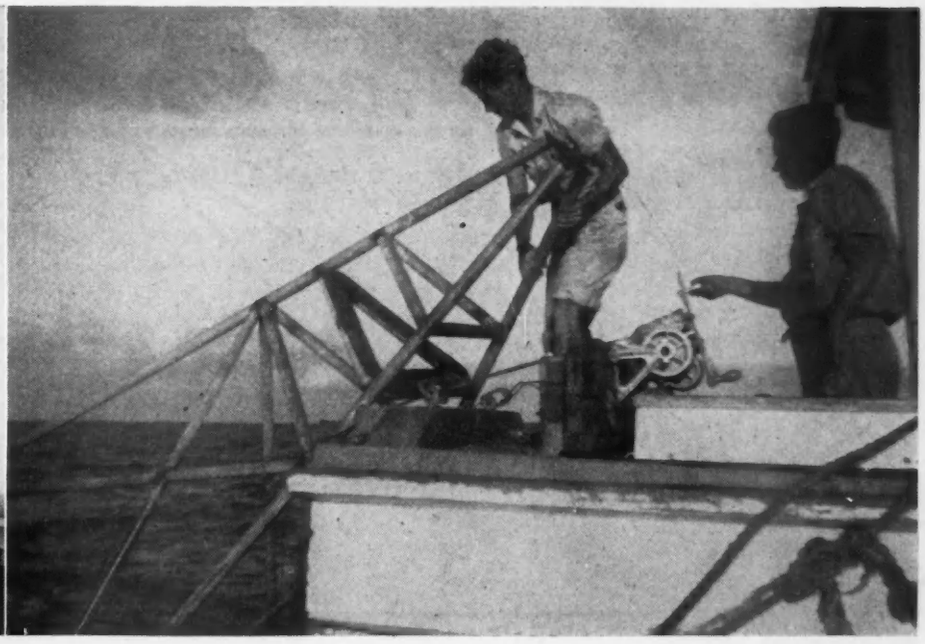

Figure 4. Tripod being pushed into upright position at a gravimetric water station.

hour, but at a lower rate of production, due to increased time required in setting up and taking down the tripod, which is caused by greater bobbing of the boat. Also, shaking of the tripod by wind and wave action begins to jar the meter and more time is required in taking the reading. It has not been found practical as yet to operate with this tripod when the wind exceeds 20 miles an hour. Preliminary runs with a tripod 26 feet high have shown it to be more stable than the 17-foot one, and it undoubtedly can be operated in a stronger wind than can the smaller. Extreme conditions under which this tripod can be operated have not been determined.

Reading Time Intervals

Under good conditions a large portion of the gravimetric readings have been taken with the 17-foot tripod at nine and ten minute intervals where the stations were 2600 to 3000 feet apart. Under less favorable conditions the time interval between readings has been as much as 15 and even 20 minutes and, as mentioned above, when the wind becomes too strong it has been impossible to work at all. Under conditions that might be considered typical in the area being worked at present, a gravimetric reading can be taken consistently on the average of once every 12 minutes. Preliminary runs with the 26-foot tripod indicate that it can be operated at approximately the same speed as the smaller one.

A typical 12-minute interval can be broken into component intervals as follows:

	Minutes
1. Interval from time the gravity reading is taken until boat is ready to move with tripod attached	2
2. Interval to travel from one station to the next (2600 to 3000 feet)	5½
3. Interval to set up tripod at station	1
4. Interval to take depth soundings, set up and read meter	3½
Total time	12

At a speed of not more than five knots any of the tripods now in use will draw less water than the towing boat. Thus the tripod can be towed any where the boat can go at this speed. At speeds up to about ten knots, the tripod does not slow the boat by more than one to two knots. The retarding effect is noticed a little more with the small tripod where a small boat is used than with the large one which is towed by a larger boat. The tripod's wide base makes it tow evenly in bad weather. In fact, in the case of a smaller boat, the tripod usually tends to lessen the roll of the boat. Also, the effect of the tripod on the boat's maneuverability is small.

In addition to the speed obtainable with this type of tripod, it has additional advantages over other devices known to the writer to be used in obtaining gravimetric readings above the water surface. Some of these advantages are as follows:

1. This tripod is welded into a solid well-braced single unit, and does not have the instability inherent in towers which are clamped or bolted together, or which have hinged joints of any kind.

2. A relatively heavy piece of equipment can be handled by a relatively small boat. Over half the weight of the tripod is supported by the water.

3. The equipment required to handle the tripod is simple and inexpensive. This reduces breakdowns and cost of maintenance to a minimum. In our case the installations required to handle the 17-foot tripod are two small hand winches mounted near the stern of the boat, a wood sheathing to protect the boat's stern, and two eye bolts in the deck between the winches and the stern. These appear in Figures 2 and 4. The installations for the 26-foot tripod are about the same except that the winches and the protection are heavier.

4. The size of the tripod base is not limited by the boat dimensions. Since the tripod is never lifted onto the boat to be carried, the beam of the boat does not have to be considered in connection with the deciding how large the base should be. This makes it possible to have a tripod with a large base, which is extremely important in obtaining stability. To illustrate, the base of the 17-foot tripod has 10½-foot sides. The base of the 26-foot tripod has 18-foot sides. Another tripod is under construction which is 28 feet high and has a base with sides of 20 feet. All of these bases are considerably larger than the beams of the boats used to tow them.

Since these tripods are being used in areas where the bottom is firm, and the problem of obtaining readings on soft bottom has not arisen, the efficiency of a modified version of this type tripod, designed especially for work in soft bottom areas, has yet to be tested.

Figure 5. Gravimetric reading being taken on tripod at water station.

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WALTER TRACTOR TRUCKS

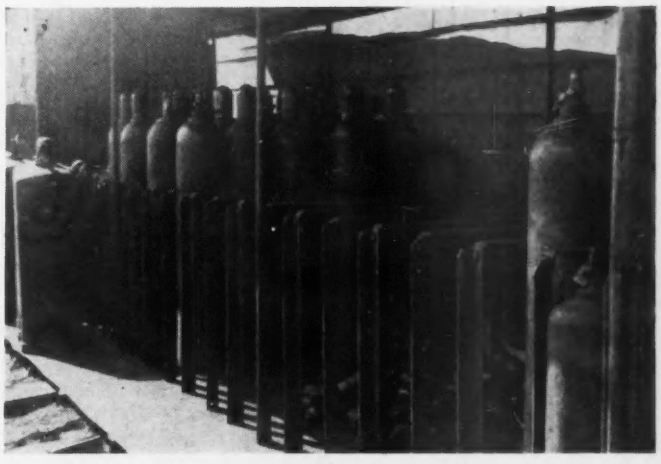
Bumper-Exhaust Combined

EXHAUST CONTROL

The ingenious method utilized by one service company for spreading exhaust gases as far forward from the vehicle as possible while the latter is backed up to a well, has numerous advantages and can be adapted to nearly any oil field vehicle. Substituting for the front bumper is a rigidly-mounted length of pipe which is boxed in on the front, top and bottom sides by floor plate material as shown. The engine exhaust, instead of running out to the rear in conventional manner, is brought forward through flexible tubing to the back side of the new bumper section. Exhaust is deflected to either side of the truck, thus considerably reducing danger of ignition of well gases as well as making more breathable the air at the back of the unit where crews are working.

The new bumper is sturdy enough to serve well as the conventional unit, and has an appearance such that on casual inspection, few would suspect it to be an exhaust outlet.

Partitioning Segregates Oxygen Bottles



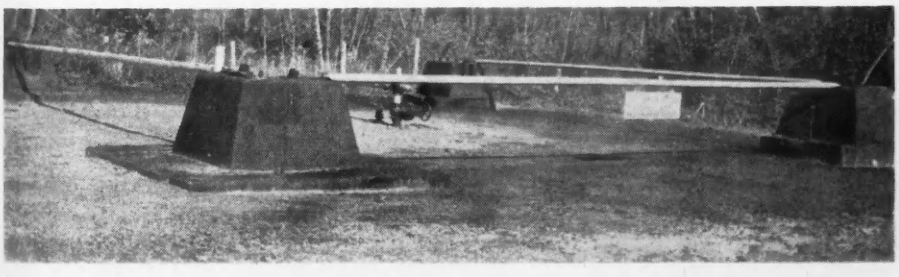
MATERIAL STORAGE

Storage and segregation of oxygen and acetylene bottles always is a problem in a large shop where considerable welding is being done. New and used bottles become mixed up, causing lost time and confusion during the day's work. One welding shop foreman devised a partially enclosed shelter outside the shop which has a number of partitioned or slotted spaces in which bottles may be stored. Pieces of two-inch angle iron set vertically in the concrete flooring were tied together with lengths of scrap iron attached across their upper ends as illustrated.

With some twenty of these slots available for bottle storage, it is relatively easy to keep the several classifications separated. The comparatively slight cost of the installation will be repaid many times in increased efficiency of the shop.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

Foundation Corners Provide Guard Rail Supports



LEASE PROTECTION

On wells where the servicing derrick has been removed, the corner foundations may be used as posts to support guard rails in preventing ingress of stock to the well head and possible damage to the Christmas tree by intruding vehicles. The guard rails shown are made from scrap two-inch pipe which have been flattened on each end. A hole was cut with a torch in these flat sections to match the bolts set in the concrete corners. If several such installations are made, such guard rails can be made up in the shop and carried to the well site, since the distance between the anchor bolts are equal on each well.

After installation, the guard rails are painted a bright color and the lease identification sign may be hung from a midpoint along the rail. In case the well is to be worked over by a portable pulling unit, the guard rails may be easily removed by unscrewing the anchor bolt nut from each corner foundation.

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LENGTHS
20'
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30'

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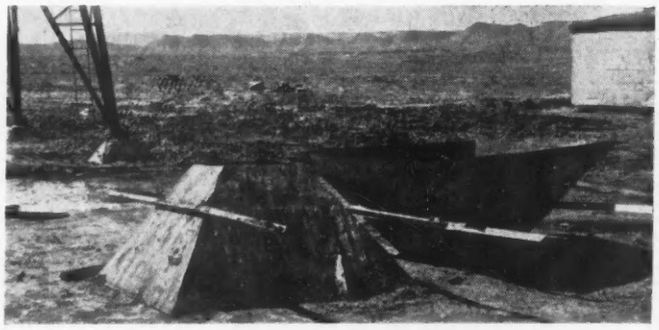
Metal Forms Facilitate Pouring Derrick Foundations



Where the scrap materials are available and the need warrants its use, the hint described below

DERRICK FOUNDATIONS

will save the operator money and time, and eliminate the wooden forms previously used. Pouring derrick leg footings has been considerably simplified through the method employed by one company operating in the Rangely, Colorado, field. Instead of using wooden forms, a unitized form made of salvaged, flattened tank siding welded together as shown provides the necessary equipment. The pyramidal forms are made to the dimensions required by the operator. Angle iron handle bars located on both sides of the pyramidal form about 18 inches off the ground facilitate handling while setting up before pouring the concrete as well as in removing them after the concrete has hardened.

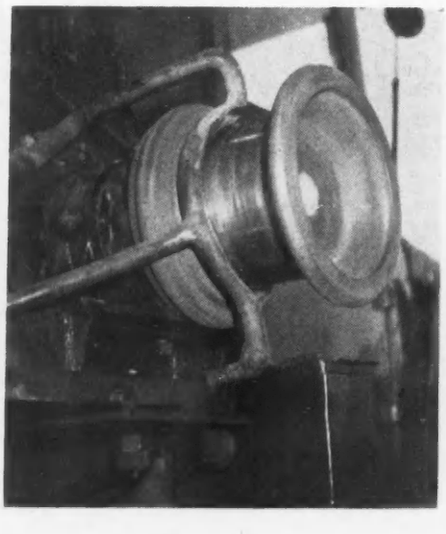
Foundation requirements for the servicing derrick may vary from field to field where soil conditions vary. However, a modified design of the type illustrated will not only reduce the time of installation, but save in lumber ordinarily used for these forms. A foundation of uniform dimensions is assured.

Cat Head Guard

When cat heads are attached to the end of the shaft of pulling machine draw works, the projecting bearings present a hazard that is serious if the cat line should become fouled during operation.

SERVICING UNITS

One company eliminated this hazard by welding a guard made from one inch bar stock to the frame of the pulling machine in such a manner as to prevent the spinning rope from reaching the inside of the cathead. By heating and bending the bars, three cross members protect the front of the shaft, while a circular piece fits down close to the smallest outside dimension of the cat head so as to prevent the cat line from riding down under the bar.



Support Speeds Pipe Work

A pipe support which provides invaluable aid in the pipe or welding shop consists of a short saw-horse type of steel support that is provided with a variable-height bracket which can be adjusted to the needs of each job. The double rack may be elevated in two-inch increments. Atop the rack is a horizontal two-foot long roller which allows the work to be pushed forward or backward according to the needs of the workman, this roller feature often eliminating need for an assistant to be in constant attendance.

PIPE HANDLING

The easily constructed device fills many services in the shop.

Gasoline Stocks Accumulations Slowed Despite Stepped-Up Refinery Activity

Stepped-up refinery activity resulted in increased output of all principal refined products during the week ended February 22. Despite this increased production gasoline stock accumulations slowed slightly from previous weeks and reductions of burning oil inventories continued heavy. These trends were revealed in the latest weekly bulletin of the API.

Production of crude in the U. S. during the week averaged 4,786,000 barrels daily to show an increase of 28,000 barrels a day over the previous week's daily output. Compared with last year's corresponding week it was an increase of 72,000 barrels or 1.5 percent daily.

Input of crude to refinery stills during the week averaged 4,860,000 barrels a day, an increase of 123,000 barrels daily over the last week's runs. This was 231,000 barrels or 5 percent higher than the charges to stills during last year's like period.

Stocks of refinable crude increased 1,700,000 barrels to total 222,013,000 barrels on February 15, the Bureau of Mines reported. Those stocks were 2,749,000 barrels or 1.2 percent less than those in storage a year before.

An increase of 706,000 barrels brought gasoline output to 14,668,000 barrels for the week, which was 1,757,000 barrels or 13.6 percent more than was produced in the like period a year ago. This production total includes natural blends at the refineries. Stocks of finished and unfinished gasoline stocks were increased 856,000 barrels and totaled 103,904,000 barrels at the week's end.

The week's stock additions showed some letup from the past several weeks when over 1 million barrels were added in each period. Stocks are still trailing those of a year ago by 1,017,000 barrels or 1 percent.

Production of distillate fuel oil totaled 5,929,000 barrels in the period, an increase of 639,000 barrels from the previous week's output and 184,000 barrels or 3.2 percent more than was produced in last year's week. This light fuel's stocks dropped 2,054,000 barrels to 40,739,000 during the week. Those stocks were 14,653,000 barrels or 56.2 percent higher than the 26,086,000 barrels being held a year before.

Residual fuel oil output was stepped up 281,000 barrels to total 8,542,000 barrels for the week, which was 420,000 barrels or 5.2 percent more than was produced in the like period of last year. Withdrawals totaling 1,596,000 barrels were made from stocks of residual, dropping them to 44,919,000 barrels. That amount was 5,598,000 barrels of 14.2 percent more than the 39,321,000 barrels that were in storage a year before.

Products Prices Unchanged; Demand Continues Strong

Market prices for refinery products were generally unchanged during the week, and demand for these products at the standing prices was good or showed improvement in most areas.

Practically all areas reported that demand for gasoline and fuel oil was high, prices were firm and supplies tight. No further reports on kerosine and distillate fuel price shading came out of New York harbor and prices there are considered more firm. There were, however, reports of reductions in No. 2 fuel prices from the Springfield, Mass., and Hartford, Conn., areas.

The Atlantic Refining Company announced that its No. 2 fuel tank wagon prices had been reduced .2 cent to 9.1 cents at Springfield, and .3 cent to 8.7 cents at Hartford, effective February 19 and 20, respectively. Socony-Vacuum Oil Company reduced its posted tank wagon price for No. 2 fuel oil .9 cent to 7.5 cents at Danbury, Conn., effective February 20.

Kerosine remained scarce in supply on the Texas Gulf Coast and most suppliers were unwilling to part with it for less than 5.75 cents. A sale of four cargoes of heavy diesel fuel was reported by a Gulf Coast supplier for $2 plus a cent for each cent increase in price of crude prior to lifting date.

A further increase in gasoline prices on the open market was reported by Midwestern jobbers and tank car marketers.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1943	4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	4,762	9-30	4,798	12-30	240,992	1- 1	89,162	4- 1	48,162	10-28	64,744	10- 7
1945	4,944	7-21	[5]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	4,786	2-22	4,917	1- 4	223,737	2- 1	103,904	2-22	58,034	1- 4	53,285	1- 4
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 3
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-13
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-18	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	220,258	9- 9	76,302	1- 1	30,232	4-19	49,737	3-18
1945	3,621	10- 6	3,409	10- 6	[4]211,813	8-25	70,791	10-13	26,483	3-17	38,548	8-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	1-11	4,737	2-15	220,313	2- 8	94,882	1- 4	40,739	2-22	44,919	2-22

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 1	4,650	4,783	223,737	14,610	100,579	5,600	48,131	8,516	47,947
February 8	4,770	4,785	220,313	14,653	101,705	5,193	45,093	8,278	47,537
February 15	4,758	4,737	222,013	13,962	103,048	5,290	42,793	8,261	46,515
February 22, 1947	**4,786**	**4,860**	.....	**14,668**	**103,904**	**5,929**	**40,739**	**8,542**	**44,919**
February 23, 1946	4,714	4,629	[6]224,762	12,911	104,921	5,745	26,086	8,122	39,321
Change:									
In Week	+28	+123	+1,700	+706	+856	+639	—2,054	+281	—1,596
In Year	+72	+231	+2,749	+1,757	—1,017	+184	+14,653	+420	+5,598
In Year	+1.5%	+5.0%	—1.2%	+13.6%	—1.0%	+3.2%	+56.2%	+5.2%	+14.2%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shut-down of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, February 16, 1946.

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Bromide Discovery May Be Important Find for Oklahoma's Anadarko Basin

Deep oil field found north of Lindsay, McClain County; old Carter County field revived; West Edmond pool extended south; oil pool opened in Hughes County; Republic Natural enters Eola area; new pay sand discovered in old Crescent field.

McClain County: Discovery of a deep oil field northeast of Lindsay may prove to be another outstanding strike for the Anadarko Basin. The well, C. L. Carlock et al's Rose Harrison 1, NE NW SE 25-5n-4w, perforated casing in the deep Bromide (Wilcox) zone and flowed 301 barrels of 44-gravity oil to tanks in 12 hours through ¼-inch bottom hole choke on tubing. The test is a mile east of the Max Pray & R. L. Bauman's Ainsworth, a producer from the Hunton lime zone, and is 1½ miles north of Pray & Bauman's Rose 1, Hunton lime discovery well.

Location is on an 80-acre farmout from Sun Oil Company. The lease is surrounded by major company holdings, including the Carter Oil Company, Cities Service Oil Company, and Sinclair Prairie Oil Company.

Total depth is 10,707 feet but exact producing depth has not been released by the operators. The wildcat is in the southeast portion of the Basin, about 22 miles northwest of Sohio Petroleum Company's Howard 1, in Garvin County, which was completed in the Bromide for 2400 barrels daily.

Carter County: Activity in the old Wheeler field has been revived by 2 oilers on the west flank. Roy M. Johnson, Ardmore operator, has developed a couple of leases and added 10-barrel pumpers from the shallow pay zone. Caldwell 8-A, SW SE NW NW 27-3s-2w, made 10 barrels per day from Pennsylvanian sand at 986-98 feet, and Caldwell 9-A, NW NW SW NE Sect. 27 pumped 10 barrels from sands at 820-40 feet, and 950-68 feet. McGill 2, SE SE NE NE 28-3s-2w, drilled to 972 feet, and set pipe on top of the sand, preparatory to testing. The Wheeler pool was discovered in May, 1904, by Santa Fe Railway Company in 21-3s-2w. One producer and 3 dry holes were drilled in 1905, but in 1906 both oil and gas were developed in a 2-zone well. Gas subsequently was developed at 300 and 600 feet in sand zones, with oil at 960 and 1024 feet. The wells averaged as high as 225 barrels natural a day. Oil is of low gravity, dark in color, and asphaltic.

Oklahoma County: The 4-county West Edmond pool has been extended nearly ½ mile south by Sinclair Prairie Oil Company's Clausewitz 2, CSE NE 9-12n-4w. The test flowed 397 barrels of oil in 11½ hours through 22/64-inch choke from Hunton lime, 7125-60 feet. Gas was gauged at 443,000 cubic feet daily, with tubing pressure 821 pounds and casing pressure 700. Total depth is 7230 feet.

Hughes County: The Greater Seminole Area continues among the state's most active regions. Latest pool opener is F. A. Gillespie & Sons' Meadors (Bilby) 1, NW NW SW 31-8n-9e. Booch was topped at 2780 feet, and while crew was cleaning out the well swabbed an estimated 100 barrels of oil per day. Producing horizon is from 2790-811 feet. Booch production is prevalent in the area.

Garvin County: Republic Natural Gas Company has announced its first oil development in Oklahoma with the staking of Harmon 1, SE SW SE 8-1n-2w, ½-mile north and a location east of the new Eola field discovery well of Sohio Petroleum Company. The company has asked contract bids on Goeske-Smith 1, SE NE SE 17-1n-2w, ½ mile west of Sohio's Howard 1, on a 40-acre lease. Location has also been surveyed for Harmon 2, SE SE SE 8-1n-2w.

Garfield County: Ross Porter et al's Seigle 1, SW SW SW 32-23n-4w, west of Garber, broke loose with a gas flow and blew out of control for several days. The well, which opened the Southeast Spring Valley pool in August, had been producing oil from the Second Wilcox sand at 6045-65 feet, total depth 6125 feet. The well was started in April, 1946, by J. E. Crosbie, Inc., and was drilled to 6125 feet, testing a number of oil and gas showings. None was regarded of particular importance however, and Crosbie turned the well over to Porter and J. Barnett, who perforated casing between 6067-68 and 6039-49 feet. It was completed for about 50 barrels per day on the pump and when the blowout occurred was making around 30 barrels daily.

Logan County: A new sand which showed gas below the Second Wilcox sand zone in the heart of the old Crescent field has been discovered by Mid-Continent Petroleum Corporation's Campbell 3, NW SE NE 33-7n-4w. The new sand was encountered at 6504 feet and showed an estimated 5 million cubic feet of gas a day at 6529 feet. Objective is the Arbuckle lime zone, and crew is now drilling below 6531 feet after killing the gas. Geologists were reported checking records to escertain the gas-producing horizon.

Grant County: Looming as a prospective pool opener is Stauffer Petroleum Company's Hall 1, NE NE SE 9-25n-7w, east of Nash Townsite. A good gas show was encountered at 3100-450 feet in the Hoover-Tonkawa zone, and some free oil was recovered at this depth. Hole was being loaded with mud to prevent a possible gas blowout, and crew will drill to the Bartlesville sand before testing

Wells Completed in United States in Week Ended February 22, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1946
Alabama														2	
Arkansas					1	1							1	7	6
California	25		1		3	29	1	1		1	6	8	38	44	34
Colorado											2	2	2	2	3
Florida											1	1	1	1	
Illinois	19				5	24					6	6	30	29	42
Indiana	3		3		2	8					2	2	10	13	9
Kansas	30		20	1	9	60	2				4	4	66	39	30
Kentucky	2		2		3	7							7	14	10
Louisiana	6	3			5	14			1		5	6	20	21	23
N. Louisiana	5	1			4	10					3	3	13	7	7
S. Louisiana	1	2			1	4			1		2	3	7	14	16
Michigan	5				1	6	1				2	2	9	4	12
Mississippi	3					3		1			2	3	6	3	1
Montana														2	7
New Mexico								1				1	1	10	5
New York	13			12	1	26							26	25	26
Ohio	5		9		1	15					1	1	16	21	5
Oklahoma	31		2		12	45	2	1			20	21	68	89	64
Pennsylvania	27		7	15	1	50	1						51	55	45
Texas	96	2	13		25	136	3	3			29	32	171	185	151
South Central	3					3					3	3	6	8	5
Middle Gulf	8	2				10							10	11	[1]
Upper Gulf	7				3	10					2	2	12	13	10
L. Gulf-S.W.	8		4		5	17					4	4	21	18	35
East Central	1		1			2					3	3	5	1	[2]
Northeast	3		1		2	6							6	13	11
North Central	6		1		6	13		1			5	6	19	22	[3]
West Central	2					2	1						3	6	[4]
West	30				1	31		1			3	4	35	36	38
North	27				8	35	2	1			9	10	47	46	42
Panhandle	1		6			7							7	11	10
West Virginia	2		22		5	29							29	17	11
Wyoming	4					4					2	2	6	5	4
Total U.S.	271	5	79	28	74	457	10	7	1	1	82	91	558	588	488

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] N. Central included with North. [4] West Central included with West.

further. Nearest production is in the Northwest Hillsdale field, about 12 miles southwest.

Beckham County: A new gas pool may be opened by Shell Oil Company's Walters 1, CNE SW 14-10n-21w. Although a tight hole, information obtainable indicated that a good show of gas was found at around 12,267 feet. The wildcat is 4 miles south of Elk City.

Okfuskee County: J. E. Crosbie, Inc., has apparently opened a new horizon in the old Paden area. Schultz 1, SE NE SW 30-12n-7e, recovered 250 feet of oil and some mud on a drill-stem test at 3344-64 feet in what is believed the Earlsboro sand. Other production in the field is from Prue. Seven-inch casing has been set at 3330 feet.

Mid-Continent API Group Announces Committeemen

Chairmen of the various committees which will handle arrangements for the spring meeting of the Mid-Continent District, API Division of Production, to be held in Amarillo, May 22-23, have been announced by Harold S. Kelly, Phillips Petroleum Company, district chairman.

The program committee, under the chairmanship of M. L. Horner, Barnsdall Oil Company, Tulsa, is already at work. Other chairmen include: R. C. Kay, Amarillo, general arrangements; C. M. Copeland, Williams-Copeland Drilling Company, Tulsa, registration; Alex Schneider, Pampa, meeting room facilities; N. D. Bartlett, Amarillo, publicity; and L. R. Hagy, Hagy, Harrington and Marsh, Amarillo, entertainment.

• Kansas

Shell Well Gets Depthograph Potential of 83,000 Barrels

Ellis County well receives depthograph potential of nearly 83,000 barrels; Kiowa County wildcat may open oil pool; Barton County wildcat gets free oil on test.

Ellis County: A test that may prove to be one of the best oil wells ever drilled in western Kansas received a depthograph potential of nearly 83,000 barrels daily on a recent test. Shell Oil Company's Ridler 1, SW NW NW 2-11s-18w, in the Burnett Northwest pool of North-Central Ellis County, made a potential by depthograph of 82,935 barrels a day from the Arbuckle lime, 3570-75 feet. Arbuckle was topped at 3570 feet. When the plug was drilled out, the hole filled 2100 feet with high-gravity oil in 40 minutes, and crew then swabbed for 2 hours and 30 minutes, recovering 57 barrels the first hour, 69 the second and 33 barrels the following 30 minutes. Tubing was then run and the pay zone treated with 500 gallons of hydrochloric acid, and when opened up, the well made 97 barrels in 1 hour, free of any water contamination. The official depthograph test for taking potential was then run, and registered 82,935 barrels, if permitted. Automatically the new well was given a Kansas Corporation Commission rating of 3000 barrels a day, or the "maximum" production. It is the second well for the Burnett Northwest pool, being an east offset to Continental Oil Company et al's discovery well.

Kiowa County: Stanolind Oil & Gas Company et al apparently will give the county its first commercial oil production with Sealy 1, NW NW NW 25-30s-18w. Eight miles southeast of the Alford gas pool and many miles from oil production, the wildcat swabbed 6 barrels of oil and 5 barrels of water per hour from the Mississippi lime, 5070-95 feet. Gravity of the oil is 33.

Barton County: The Lion Chemical Company may open an oil pool with Merten 1, wildcat in SW SW NW 12-20s-14w, 2½ miles north of the Prichard pool. Free oil was recovered on a drill-stem test at 3502-25 feet, with tool open 15 minutes. Thirty feet of mud and 5 feet of oil-cut mud also were recovered. Testing will continue at this depth before the well is deepened. Arbuckle lime was topped at 3491 feet.

• New Mexico

Lea County Test Registers Oil Strike from San Andres

Lea County has second oil strike from San Andres within a month; Quay County prospect nearing Pennsylvanian beds; San Juan County deep test to deepen after showing little gas in Dakota.

Lea County: The Texas Company's Garrett 1, C NE SE 22-16s-38e, 9 miles east by north of the Lovington field, nearest New Mexico production, and southwest of the Jones Ranch field, Texas, is showing for a marginal pumping discovery. This wildcat swabbed 49 barrels of oil on 8-hour test after using 8000 gallons of acid in open hole at 5540-690 feet, having plugged back from 5670 feet and will perforate op-

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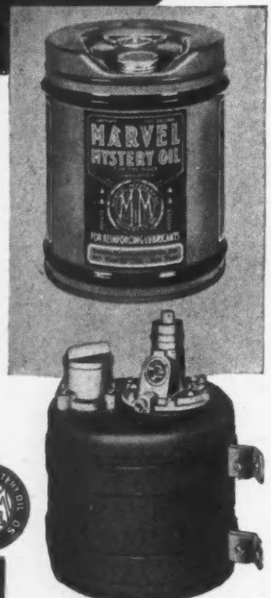

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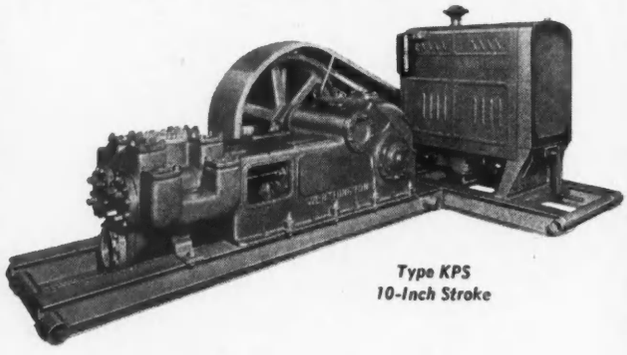

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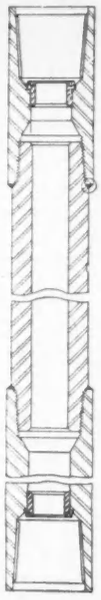

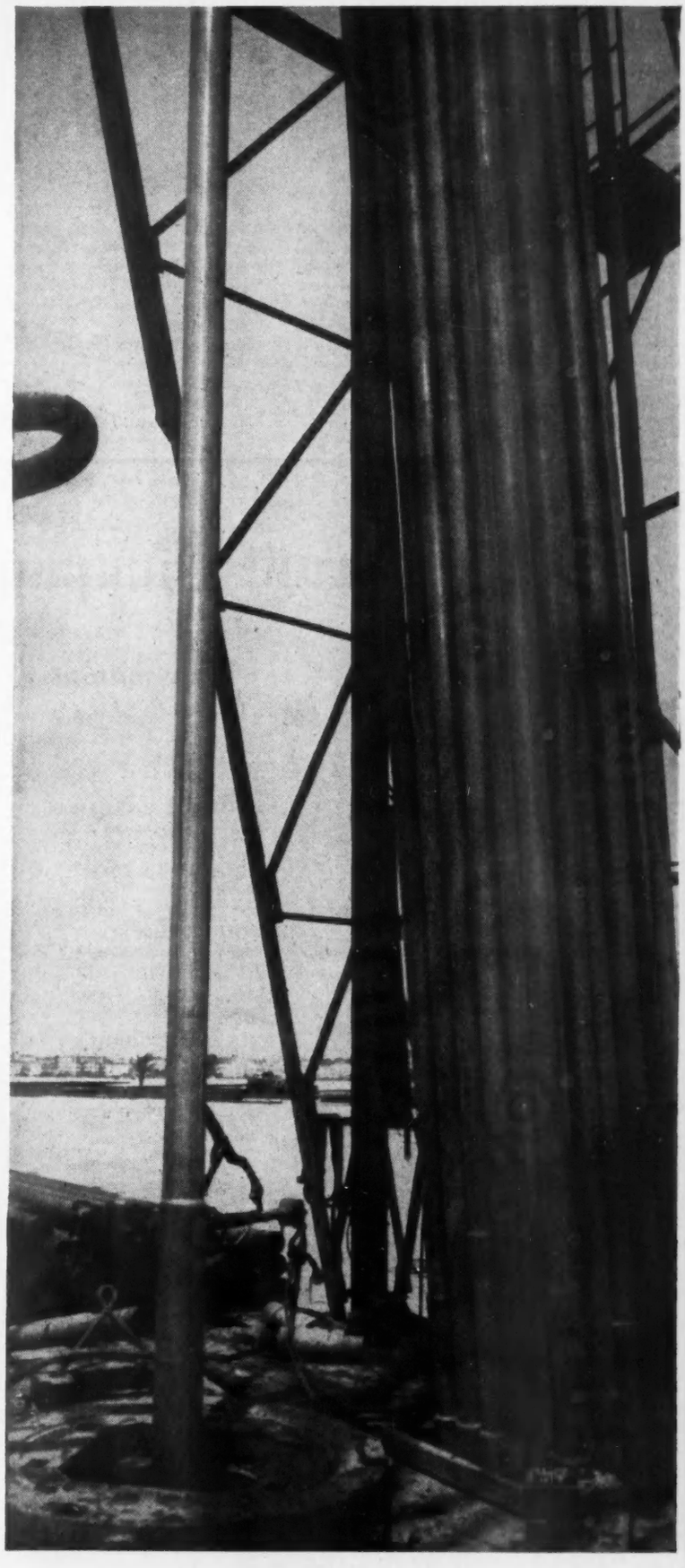

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posite an upper zone of porosity. The San Andres was topped at 4940 feet, with elevation 3716 feet, correlating 109 feet high to a 10,085-foot failure 1¼ miles southeast. The company has spudded State 1-AK, C SE SE 16-16s-38e, 1¼ miles northwest of the discovery, as lease is due to expire in April. Numerous leases in the area require development by mid-year, but the majority is likely to be surrendered upon expiration date unless more profitable production is developed. The Texas Company has been renewing some of its leases at $12.50 per acre cash bonus.

Devonian Oil Company's Browne-Federal 1, NW NW 19-9s-38e, discovery in the northeast part of the county and 13 miles northwest of production, was completed flowing 121 barrels of 25.4-gravity sour oil and 20 barrels of basic sediment and water through 24/64-inch choke after acidizing broken San Andres at 4926-5011 feet. The production will be tank-trucked 40 miles at the expense of the producer to a refinery at Levelland, Texas, in order to obtain a market.

Quay County: G. C. Jensen Oil Company's First National Bank 1, C NW SE 27-10n-31e, 6 miles southeast of Tucumcari, was drilling at 3050 feet, with Pennsylvanian beds anticipated within the next 200 feet. This wildcat passed up nominal oil and gas showings in the San Andres, topped at 1822 feet with elevation 4149 feet, and the Yeso was entered at 2425 feet.

San Juan County: Byrd & Frost, Inc., et al's Hargrove-Federal 1, Kutz Canyon deep prospect, was making a new production test at 6623 feet in Dakota sand, topped at 6475 feet with elevation 6149 feet. Previous tests revealed high-pressure but a small volume of gas with trace of 54-gravity distillate, or crude. It is scheduled to deepen to water.

Union County: The Pure Oil Company's Wiggins-Black Mesa Unit 1, NE NE SE 13-31n-36e, 5 miles west of Kenton, Okla., was making production test for possible gas, with 5½-inch pipe at 3300 feet. This wildcat was drilled to granite at 3540 feet, with elevation 4343 feet.

• West Texas

Ordovician Oil Discovery in Prospect for Pecos County

Ordovician oil strike in prospect for Pecos County; Gaines County wildcat has oil show in Clear Fork; Block 39 Prospect in Crockett County lists 2 small gassers from Ellenburger; Scurry County shallow belt enlarged.

Pecos County: George T. Abell et al's Dietrich-Eager 1, C E¼ of N¼ H&TC Railway 20, Block 2, 2 miles southeast of the Abell multi-pay field and in the Buena Vista area, was perforating higher in the Simpson series after swabbing 1 barrel of fluid hourly, averaging one-fourth oil and the remainder salt water from openings at 5070-85 feet. This wildcat landed pipe at 5167 feet, or 6 feet off bottom after a drill-stem test at 4995-5102 feet yielded 270 feet of heavily oil- and gas-cut mud. It is 1⅜ miles southeast of a 6483-foot failure that entered barren Ellenburger at 6282 feet.

Gaines County: Cities Service Oil Company's Riley 1, C NE NE Sect. 361, Block G, 4½ miles northwest of the Doss field but separated by a 6192-foot failure, recovered 180 feet of nominally oil- and gas-cut mud and 145 feet of heavily oil- and gas-cut mud when tester was used in Basal Clear Fork at 7044-7102 feet. This zone correlates flat with the nearest oil producer. Additional oil saturation was logged in drilling to 7195 feet, where test was pending. Riley 1 entered the Brayburg at 4210 feet and San Andres at 4420 feet, with elevation 3409 feet.

Crockett County: Stanolind Oil & Gas Company's University 1-TT, C SW SW Sect. 12, Block 39, ½-mile north of its capped Ellenburger failure for the Block 39 area, tested gas at the rate of 1,790,000 cubic feet daily from perforations at 8100-48 feet in Ellenburger, topped at 8085 feet. It will be acidized. The hole is bottomed at 9000 feet in dry Hickory (Cambrian) sand, topped at 8790 feet. Shell Oil Company's University 1, south outpost, was due to reacidize open hole at 8060-284 feet in Ellenburger, topped at 8040. Initial acid treatment boosted the gas flow temporarily to the 8 million foot daily rate, but production subsided to ½ million within 2½ hours. Unusually high prices were paid the University for leases in this area.

Scurry County: Mid-West Drilling Company and John Odstriel's House 1, northwest corner of Subdivision 17, Block 3, J. P. Smith Survey, extended the Northwest field, or shallow portion of the Sharon Ridge area, 1¼ miles east in filling with oil after nitro shot at 1638-83 feet. The lime was encountered at 1369 feet, with elevation 2174 feet, and drilled to 1694 feet. This shallow pumping area was discovered in June, 1923, but continues to expand and has

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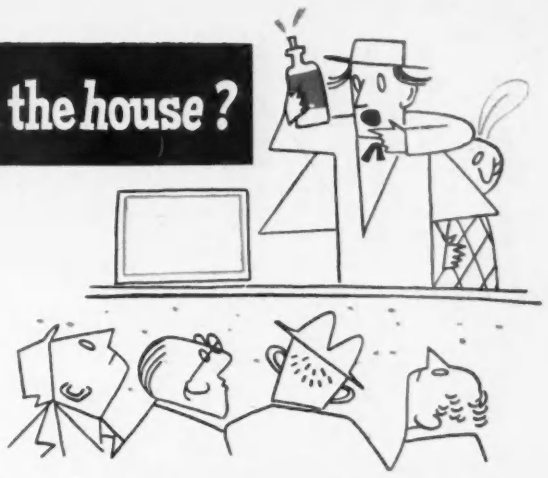

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received considerable development within the past year.

Ector County: Gulf Oil Corporation and E. E. Fogelson's University 1-A, which recently indicated deep-pay discovery for the Jordan field from Ellenburger, topped at 8914 feet and drilled to water at 8985 feet, was making production test of perforations at 8925-35 feet.

Gulf's Goldsmith 421-E, Goldsmith field deep test that passed up oil flow in the Devonian, topped at 8055 feet, was coring at 9668 feet in Basal Simpson, with the Ellenburger anticipated near this level. Phillips Petroleum Company's TXL 1-M, projected 12,000-foot Ellenburger test and 1¼ miles west of the Goldsmith field, was drilling Permian lime at 7970 feet without shows since logging 450 feet of oil- and gas-cut mud from Clear Fork at 6970-7083 feet.

Humble Oil & Refining Company's Cowden 1-G, mile southeast outpost for the Andector 7-well field, flowed 131 barrels of fluid, including 62 percent 42.8-gravity sweet oil and the remainder basic sediment and water on 8-hour natural test through open tubing from open hole at 8619-35 feet and perforations at 8613-19 feet.

Winkler County: Santa Fe Petroleum Company's Wheeler-Magnolia 1, C NW NW PSL 21, Block B-6, was using tester at 11,840 feet in Ellenburger, topped at 11,805 feet, or 321 feet high to a 12,305-foot failure 5 miles northwest. Amon G. Carter et al's Wight-Gulf 1, 2⅞ miles southeast of the Santa Fe prospect, was drilling Montoya lime at 10,540 feet, having correlated 371 feet on the Devonian, topped at 9990 feet.

Andrews County: Shell's McCrea 1, east offset to its Nelson field discovery, entered the Ellenburger at 10,465 feet, or 85 feet low, and production test of open hole at 10,494 feet yielded a 323-barrel oil flow daily through 2-inch after acidizing. Two failures were drilled south and southwest of the discovery.

Coke County: Sun Oil Company's Fred Jameson 1, south offset to its Jameson field discovery and 49 feet high on the Crinoidal, topped at 6136 feet, established the base of the oil and gas zone at 6352 feet, and was drilling at 6450 feet. No water was encountered in the discovery zone. Production from the Simpson and Ellenburger is anticipated. Sun is moving in 2 more contract rigs. Several outposts may be authorized shortly to try to prove sufficient locations to permit a big drilling program, and attract a direct pipe line connection.

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• Texas Panhandle

Gray County Gas Area Given 3½-Mile South Extension

Gray County gas area extended south; new development slated for Hutchinson County; Ellenburger prospect under way in Anadarko Basin sector.

Gray County: Phillips Petroleum Company's Stoebuck 1, NW NW SE H&GN Railway 15, Block B-2, extended gas production 3½ miles southeast in testing 1,430,000 cubic feet of dry gas daily after nitro shot and acid treatment at 2537-2646 feet. The well was plugged back from granite at 2677 feet.

Hutchinson County: Kerr-McGee Industries, Inc., and Buffalo Oil Company have each negotiated lease deals with the Whittenburg Estate to drill out assigned acreage, starting within 60 days from date of trade and to continue on a 20-acre spacing pattern until their respective acreage is fully developed, or eliminated for production. The former was assigned Sect. 3, H&OB Survey, and the west 480 acres of Sect. 12, Patillo Survey. Buffalo Oil Company obtained lease on 350 acres of Sect. 9, 346 acres in Sect. 10, and all of Sect. 11, Patillo Survey.

Roberts County: Phillips Petroleum Company's W. R. Campbell-Jenkie 1, SE SE SE I&GN Railway 38, Block 2, 12 miles southwest of Miami and near the Gray County line, was drilling at 1590 feet on Ellenburger contract. Panhandle operators have over a period of years acquired extensive acreage in the northeast portion of the district as protection against deep production possibilities arising from development of the Oklahoma sector of the Anadarko Basin, but long-term leases made it possible to defer explorations.

Royalty Owners Organize

The Old Ocean Royalty Owners Association, composed of royalty owners in the Old Ocean field, Brazoria and Matagorda counties, Texas, recently granted a state charter is undertaking a scientific and educational study of the Old Ocean field under direction of Michael T. Halbouty, Houston petroleum engineer and geologist.

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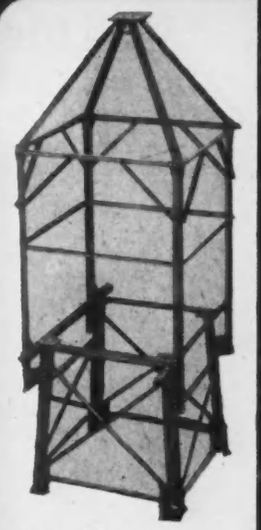

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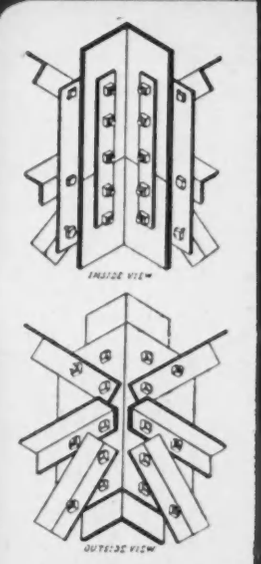


Leg joint construction on heavy-duty drilling derricks.

PARKERSBURG

• Central West Texas

Stephens County Wildcat Is New Field Opener in Bend

Stephens County has wildcat discovery in Bend; second Ellenburger discovery in Callahan County makes pumper; Coleman County has flowing discovery near failures.

Stephens County: Fred M. Manning et al's Mueller 1, SW NE Sect. 2258, TE&L Company Survey, opened a new field 4 miles southeast of Eolian in flowing 78 barrels of oil daily through ¼-inch choke after acidizing perforations at 3361-66 feet in Bend, topped at 3293 feet with elevation of 1278 feet. This area's a gas-cap zone in the top of the Bend.

Callahan County: Dick Andrade-Kramer and Brochman's Isenhower 1, NW NW Sect. 7 offsetting shallow production and 2¼ miles east by south of Putnam, pumped and flowed 60 barrels of oil with some water after using 500 gallons of acid in open hole. Production is from Ellenburger, topped at 3932 feet, with elevation 1591 feet.

E. E. Fogelson and M. S. Ingleright's Baum-Swafford 1, recent discovery for the shallow Baum field, was pumping 50 barrels daily from open hole at 3838-62 feet in Ellenburger, topped at 4840 feet. The partnership's Wallace 1, west offset to the deep discovery, was drilling below 1700 feet.

Coleman County: Anzac Oil Corporation et al's Evans 1, NE SW GH&H 27, Block 1, Bead Mountain prospect and near dry holes, flowed 75 barrels of 44-gravity oil natural on 17-hour gauge through casing from lower Fry sand at 2921-33 feet. Perforated liner will be set to exclude possible cavings from open hole above the pay.

Todd Field Property Sold

Southland Royalty Company has added to its holdings within and near the Todd two-pay field, Crockett County, Texas, in paying $450,000 cash to the Tex-La-Royalty Company for 1/12 and 1/6, respectively, of the producing and non-producing royalty under the Todd 55,000-acre ranch. Southland previously held a substantial royalty and working interest in the field's production, which is from the Crinoidal and Ellenburger.

• East Texas

Barren Cotton Valley Drilled By Quitman Field Deep Test

Cotton Valley reached by Quitman field deep test; Cherokee county wildcat showing gas after plugging back to James; Limestone County has wildcat failure in Travis Peak.

Wood County: Shell Oil Company's Goldsmith 12, projected Smackover test for the Quitman field, was drilling barren Cotton Valley at 9800 feet. Nominal oil staining and porosity logged near the contact of the Travis Peak and Cotton Valley failed to indicate production when a 6-minute drill-stem test at 9710-25 feet returned 900 feet of mud.

Bobby Manziel et al's Shamburger 1, wildcat in the Quitman Townsite, showed water in drilling the Woodbine section to 5650 feet, and is due to set pipe to try for production in 15-foot broken oil-saturated sand logged in the sub-Clarksville zone near the 4700-foot level.

Cherokee County: Standard Oil Company of Texas' New Birmingham 1, which eliminated the Travis Peak series as a source of production with numerous performations, developed a small flow of gas with 52-gravity distillate from initial perforations of the James lime section at 9156-68 feet. Next perforations will be made opposite 4 zones of porosity in this zone between 9092 and 9150 feet.

Delta Drilling Company and A. Brown's Lester 1, John H. Russell Survey, entered the Goodland lime at 5685 feet, and was drilling at 5770 feet, with the Paluxy due near this level.

Limestone County: Gregg-Tex Gasoline Corporation's Baker 1, Fallon prospect, entered the Travis Peak at 7380 feet, and was abandoned at 8006 feet.

Smith County: Delta Drilling's Lyons 1, Lindale prospect, entered barren Paluxy at 7750 feet, and was drilling at 7925 feet. It will be abandoned upon establishing the water table. Humble Oil & Refining Company's Dowell 2, northeast outpost for the Mount Sylvan field, showed promise of making a pumper after recovering 3000 feet on oil and 3770 feet of slightly brackish water when test was made of perforations at 7404-12 feet.

Anderson County: Blue Bird Investment Company's Pearson 1, Rohn Gossett Survey and a mile north of a wildcat gasser, entered the Woodbine at 5399 feet, or 23 feet high, and recovered a small amount of gas and distillate at 5530 feet. It was drilling broken sand at 5600 feet to establish the water table before attempting to complete. Seven-inch pipe was landed at 5142 feet to protect the oil and water zone at 5038 feet.

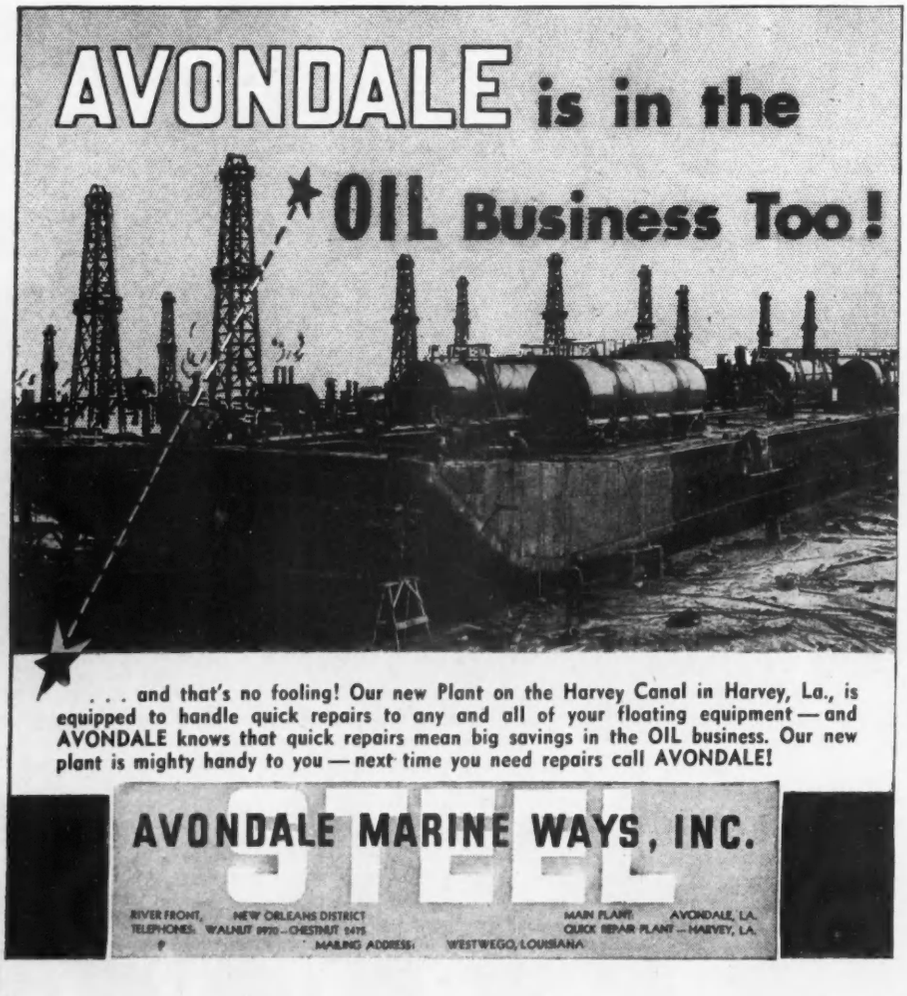
Harrison County: Stanolind Oil & Gas Company and Continental Oil Company have staked a 6700-foot wildcat, George S. Slaughter 1, in the James E. White Survey. Location is 13 miles southeast of Woodlawn, 1½ miles north of the same operator's Harry 1, which was abandoned 2 years ago at 6870 feet, after failure to complete as a commercial well from shows in the Travis Peak and Pettit.

Stanolind Buys Production For Middlewestern Plants

Stanolind Oil and Gas Company has acquired the producing properties of three separate operators in the Slaughter field, West Texas' largest producing area, for $6,708,000 cash, thus making available 2450 barrels daily oil runs from 129 wells for Stanolind Pipe Line Company's 16-inch carrier that extends from the field to affiliated middlewestern refineries. Stanolind has been buying properties in the Slaughter field, which yields 30-32-gravity sour oil, since 1941, having spent in excess of $15 million in completing 12 deals.

The largest of the latest purchases involves 90 flowing wells, averaging 1750 barrels daily, from Jerry C. Hawkins for $46,000 per well, or $4,680,000.

L. M. Glasco sold Stanolind his 21 flowing wells, which are averaging 400 barrels daily, for $52,000 per well, or $1,092,000 total. Joe A. Humphrey received the same price per well, or $936,000 for 14 flowing and 4 pumping wells that are averaging 300 barrels daily.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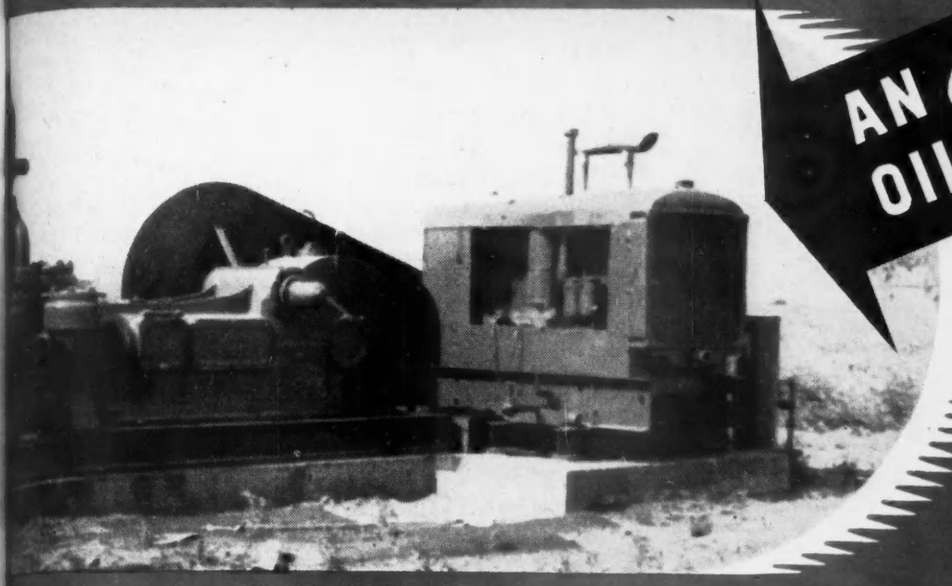

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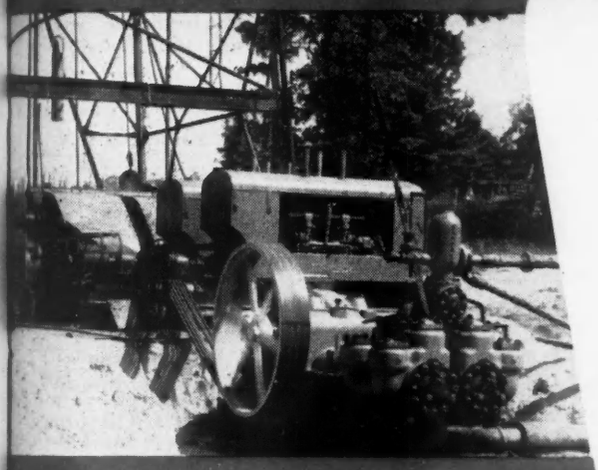

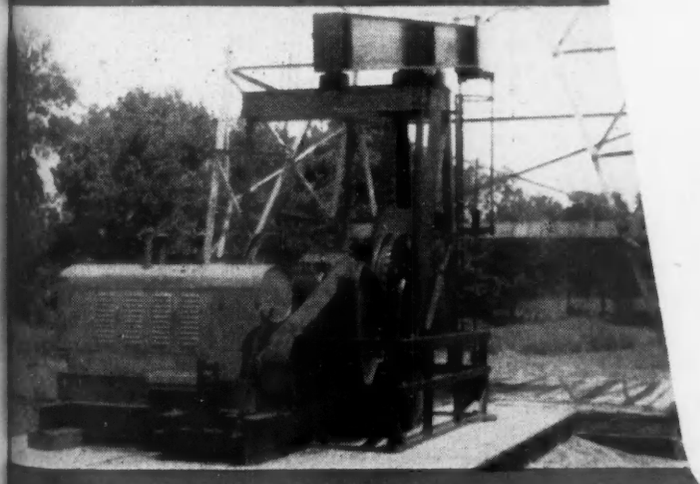

Top—Model L power unit on 6¾" x 14" shipping pump operating at 400 lbs. pressure, capable of developing 800 lbs.

Center—Two Model L power units used as power on a rotary rig. Rotary table, draw works and mud pump are driven by these two units.

Bottom—Model L power unit on a heavy duty pumping unit producing a deep well.

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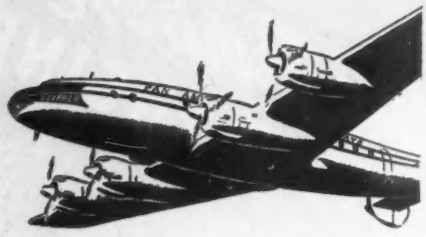

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● South Central Texas

Pump Rigged for Navarro Sand Discovery in Medina County

Pump being rigged up at Medina County discovery; 2 wildcats plugged in Atascosa County; new wells completed at Lytton Springs and Luling fields.

Medina County: Pump is being rigged up at John F. Camp & Sons' Fee 1, discovery 3½ miles southeast of Devine. Completion is being made in the Navarro sand at 2240-50 feet. Total depth is 2250 feet with 5½-inch casing set to 2240 feet. A drill-stem test at this interval, using ¼-inch chokes top and bottom, recovered 20 feet of mud and oil in 20 minutes, and casing was set for completion. This test is 1980 feet from the north line and 990 feet from the west line of J. B. Zerr Survey 48, in the southeast corner of the county.

Atascosa County: H. R. Smith et al's Tartt 6, wildcat 6500 feet southwest of Weigang field, has been abandoned as dry. Total depth is 4316 feet. One drill-stem test was made in the hole at 3768-96 feet, where 1800 feet of fresh water was recovered with two pounds working pressure.

Another dry hole for the county is Arkansas Fuel Oil Company's Adolph Jasik 1, wildcat 4½ miles northeast of Leming, abandoned at total depth of 4316 feet in the Edwards lime. A drill-stem test at 4302-16 feet recovered 210 feet of water in 30 minutes with no working pressure.

Caldwell County: A completion in the Lytton Springs field is Gulf Oil Corporation's Brewer et al 27, 180 feet east-northeast of Brewer 12. On potential the well pumped 72 barrels of 35.8-gravity oil daily. Total depth is 1866 feet with 7-inch casing set to 1118 feet and completion being from open hole in the Serpentine.

A completion at Luling field is Magnolia Petroleum Company's Mercer 24. On potential the well pumped 29 barrels of 27-gravity oil daily on the pump. Total depth is 2145 feet with 7-inch casing set to 2056 feet and completion being from open hole in the Edwards lime.

● Southwest Texas—Lower Coast

Potential Run on Atlantic's Kenedy County Discovery

Potential run on Kenedy County discovery; discovery west of Seeligson field completed; new pay discovered at South Kelsey; wildcat southeast of Boyle field waits on pump; East Longhorn outpost drills toward Yegua.

Kenedy County: Potential has been run to The Atlantic Refining Company's H. F. McGill et al 1, discovery of the first field in the county. On potential the well flowed 47 barrels of oil net daily on 9/32-inch choke, plus 59 percent salt water. Tubing pressure was 625 pounds, gas-oil ratio 1067/1, and gravity of oil being 46.2. Total depth is 9905 feet with casing perforated at 7676-80 feet for completion. This well is in the northwest corner of the county in Santa Rosa de Arriba Grant.

Jim Wells County: Magnolia Petroleum Company's David Clarke 1, discovery a mile west of Seeligson field, has been completed. On potential the well flowed 98 barrels of 47.8-gravity oil daily through ⅛-inch choke with 750 pounds tubing pressure and gas-oil ratio 605/1. Total depth is 6505 feet with 5-inch casing set to 6050 feet and perforated for completion at 4502-10 feet. This well is 1650 feet from the east line and 990 feet from the south line of Sect. 62, R. P. Haldeman Subdivision of the Seeligson Ranch.

Starr County: A new pay discovery at South Kelsey field is C. P. Burton et al's Mauro Villareal 2. From perforations at 6070-80 feet the well flowed on potential 144½ barrels of 44.8-gravity oil daily through 9/64-inch choke with 950 pounds tubing pressure and gas-oil ratio 591/1. Total depth is 7050 feet with 5½-inch casing set to 6340 feet. This well is 1230 feet north of the Villareal 1, 5900-foot sand discovery drilled by Daubert & Achning et al.

Coastal Refineries & W. D. Kennard's Coates-Vessels 1, wildcat southeast of Boyle field in the northeast corner of Share 5, Porcion 93, was waiting on pump after swabbing 4 barrels of 42.6-gravity oil per hour from perforations at 3870-82 feet. Total depth is 4319 feet with 5½-inch casing set to 3902 feet.

Duval County: M. M. Miller & Sons' Parr 1, wildcat outpost a mile northeast of East Longhorn field, is drilling below 6194 feet toward the Yegua after running a drill-stem test. On the test, at 5954-61 feet in the lower Hiawatha sand, 12 feet of oil-cut mud was recovered. This semi-wildcat is 2600 feet from the west line and 330 feet from the south line of Block 36, Parr Subdivision of the San Andres Grant.

● Middle Texas Coast

Green Field, Karnes County, Receives West Extension

Green field southwest extension test completed; Matagorda Bay wildcat completed for good flow; Burnell-Wilcox deep production try runs successful test; Outpost at Oakville-Wilcox completed as gas-condensate producer.

Karnes County: An extension for Green field is Van Norman Oil Company's Grant 1, 2100 feet west-southwest of the Mudd 1, previous southwest extension well. On completion the well flowed 90 barrels of oil daily through 5/32-inch choke with tubing pressure 325 pounds, casing pressure 525 pounds, and gas-oil ratio 450/1. Total depth is 6685 feet with 5½-inch casing set on bottom and perforated for completion at 6434-37 feet. Mudd 1, approximately ½ mile southwest of Magnolia Petroleum Company's Russell-Atkinson discovery, was completed in December from perforations at 6464-66 feet in the Slick sand.

Calhoun County: The Texas Company et al's State 1, wildcat in Matagorda Bay 4½ miles north of Port O'Connor, flowed on completion 192 barrels of 27-gravity oil daily through 3/16-inch choke, and was preparing to run potential. Total depth of the hole is 11,530 feet with production from perforations at 4970-78 feet in the Miocene.

Karnes County: Stanolind Oil & Gas Company's Ruhman 1, James Johnson Survey A-164 at Burnell-Wilcox field is drilling below 8396 feet after recovering oil on a drill-stem test at 6682-88 feet. This test developed 200 pounds working pressure in 20 minutes and recovered 660 feet of 35-gravity oil and 90 feet of oil- and gas-cut mud. A drill-

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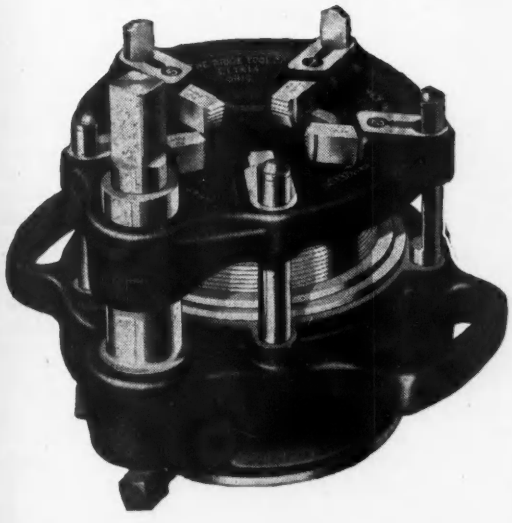

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stem test at 6690-96 feet recovered salt water.

Live Oak County: Henderson Coquat's Clara Briam 1, outpost 3000 feet south-southwest of Stanolind's Reagan 1 oil discovery at Oakville-Wilcox field, is being completed as a gas-condensate well. Total depth is 6910 feet with 5½-inch liner set on bottom and perforated for completion at 6894-6900 feet in the Luling sand. A test at 6734½-36 feet in the Slick sand flowed 8 barrels of oil daily on ⅛-inch choke. These perforations were squeezed for the Luling sand completion.

• Upper Texas Coast

North Cleveland Extension Test Receives Potential

North Cleveland extension test given potential; Humble abandons Sandune wildcat; Pinehurst well dually completed for gas condensate flow; east extension test at Altair showing for production; west extension test at Chesterville flows gas on initial test.

Liberty County: Claud B. Hamill's Zoe B. MacDonald et al 1, North Cleveland field extension area, flowed on potential 48 barrels of condensate and 2,300,000 cubic feet of gas daily. Flowing pressure on tubing was 1900 pounds and 2100 pounds on casing. Total depth is 5779 feet with casing perforated at 5767-71 feet for completion. This well is between Hamills' Stuart 1, discovery of the extension area, and North Cleveland field production.

Humble Oil & Refining Company has abandoned John Tarlton 1, wildcat in the Sandune area 5 miles west of Hull field. The wildcat flowed a small amount of gas from perforations at 9399-9407 feet, along with approximately a barrel of fluid per hour, but there was such a small flow of gas the well was abandoned. Total depth was 10,036 feet.

Montgomery County: The Gray Wolfe Company has dually completed the Pinehurst Unit 3, Pinehurst field. On potential the well flowed 92 barrels of 52-gravity condensate and 1 million cubic feet of gas daily through ¼-inch choke from perforations at 9680-9722 feet, and 100 barrels of 51-gravity condensate and 1⅔ million cubic feet of gas daily through ¼-inch choke from perforations at 11,030-060 feet. Total depth is 11,150 feet with 5½-inch casing set on bottom. This well is 1975 feet east-northeast of LaGloria's Pinehurst Unit 1.

Colorado County: Warren Petroleum Corporation's H. C. Miller 2, 2640 feet east of Miller 1 on the east side of Altair field production, cleaned into pits on initial test with 800 pounds pressure. Total depth is 10,320 feet with 7-inch casing set to 10,273 feet and perforated for completion at 10,226-54 feet. This extension test is in Patrick O'Daugherty Survey A-167.

Magnolia Petroleum Company's Jess Adams 1, west extension test in GH&H Survey at Chesterville field, flowed on initial test 1¾ million cubic feet of gas daily through 11/64-inch choke with 2685 pounds flowing pressure on tubing and 2653 pounds casing pressure. Total depth is 9606 feet, with 7-inch casing set on bottom and perforated for completion at 9557-9602½ feet.

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• South Louisiana

Wildcat in Cameron Parish Shows for Gas Production

Wildcat in Cameron Parish shows for gas production; Magnolia testing Mud Lake area wildcat; Longville confirmation testing new deeper sand; Mamou outpost flows oil on initial test; new Egan field producer completed.

Cameron Parish: Sohio Petroleum Company's Charles Richard 1, Grand Chenier area wildcat in 1-15s-5w, is a prospective gas discovery. Sands with gas show have been cored at 8250-86, 8367-99 and 10,260-300 feet. Hole is now being drilled below 10,622 feet. This wildcat is 9 miles west-southwest of Pecan Lake and 8 miles southeast of Little Chenier gas field.

Magnolia Petroleum Company's Lutcher 1-C, wildcat 4 miles northeast of Mud Lake in 24-14s-11w, is making production tests. A drill-stem test at 11,639-659 made a slight blow and perforations were squeezed for another test. The second test at 11,589-609 feet also developed a slight blow. The latter perforations were squeezed for additional tests, this wildcat having been credited with a number of sands with shows. Total depth is 11,705 feet with 7-inch casing set to 11,012 feet and 5-inch liner set from 10,855 to 11,705 feet.

Beauregard Parish: Barnsdall Oil Company's Long Bell Lumber Company 2, confirmation test in the Longville discovery area in 1-6s-10w, is testing a new and deeper sand in the field. During initial tests the well cleaned flowing wash water, oil and gas with 450 pounds tubing pressure and 800 pounds casing pressure. Total depth is 9001 feet and 5½-inch casing set to 8570 feet with open hold completion being made below the casing point in the Cockfield. Discovery well for the area was the same company's Long Bell Lumber Co. 1, ¼-mile southeast of the No. 2 well, and which flowed on completion 293 barrels of oil daily from perforations at 8228-53 feet.

Evangeline Parish: Magnolia's Ophelia Ledoux 1, outpost on the southwest flank of Mamou field in 7-5s-1e, flowed at the rate of 105 barrels of oil daily on initial tests. Flow was through ¼ and 5/64-inch chokes with 3700 pounds flowing pressure and gas-oil ratio 1524/1. Total depth is 11,625 feet with 7-inch casing set on bottom and perforated for completion at 11,566-70 feet. This test is ½ mile southwest of the Duos 1, former southwest extension well for the field.

Acadia Parish: A new producer at Egan field is Irwin & Hudson's J. R. Trumps 2-C, in 38-9s-1w, northwest side of production. On potential the well flowed 303 barrels of 38.8-gravity oil daily through 9/64-inch choke with 1625 pounds flowing pressure on tubing and gas-oil ratio 306/1. Total depth is 10,092 feet with 5½-inch casing set on bottom and perforated for completion at 10,074-084 feet.

Oklahoma Allowable Set

March crude production allowable for Oklahoma has been set at 369,475 barrels daily by the State Corporation Commission. This compares with 371,700 barrels for February and actual production of 365,913 barrels daily for January.

• North Louisiana

Lincoln Parish Hico-Knowles Field Is Given Extension

Hico-Knowles field gets 1½-mile extension; first attempt made to get oil in Ada gas field; second Kellens Ferry test shut down.

Lincoln Parish: Southwest Gas Producing Company's W. W. Farley et al 1, C NE SE 23-20n-4w, was completed flowing 144 barrels of 57-gravity distillate daily accompanied by 4½ million cubic feet of gas through ¼-inch choke, and extends the Hico-Knowles field 1½ miles northwest. The area will be developed on 320-acre spacing. The field is without gas outlet.

Bienville Parish: The Carter Oil Company was preparing to begin core tests in Emma Stark 1, 2-17n-8w, first try for oil production in the Ada gas field. The well is below 5328 feet and will take cores from the Rodessa zone.

Franklin Parish: Sohio Petroleum Company has shut down Ayer Timber Company 2, C NE NW SE 26-14n-9e, second test in the Kellens Ferry field, at 6933 feet. The well is drilling tight, some reports indicating that good showings of gas and distillate were logged at 6613-25, and others that no showings have had commercial possibilities. The field discovery, Ayer Timber 1, NW SW NW 26-14n-9e, was completed from the Tuscaloosa at 6572-86 feet.

Claiborne Parish: G. H. Vaughn's A. P. Milner 2, C NW SE 22-23n-8w, indicates probability of being the third producer from the Smackover lime in the Haynesville field. The well is at total depth of 10,327 feet, and preparing to complete. Cores from 9960-10,000 feet showed good saturation.

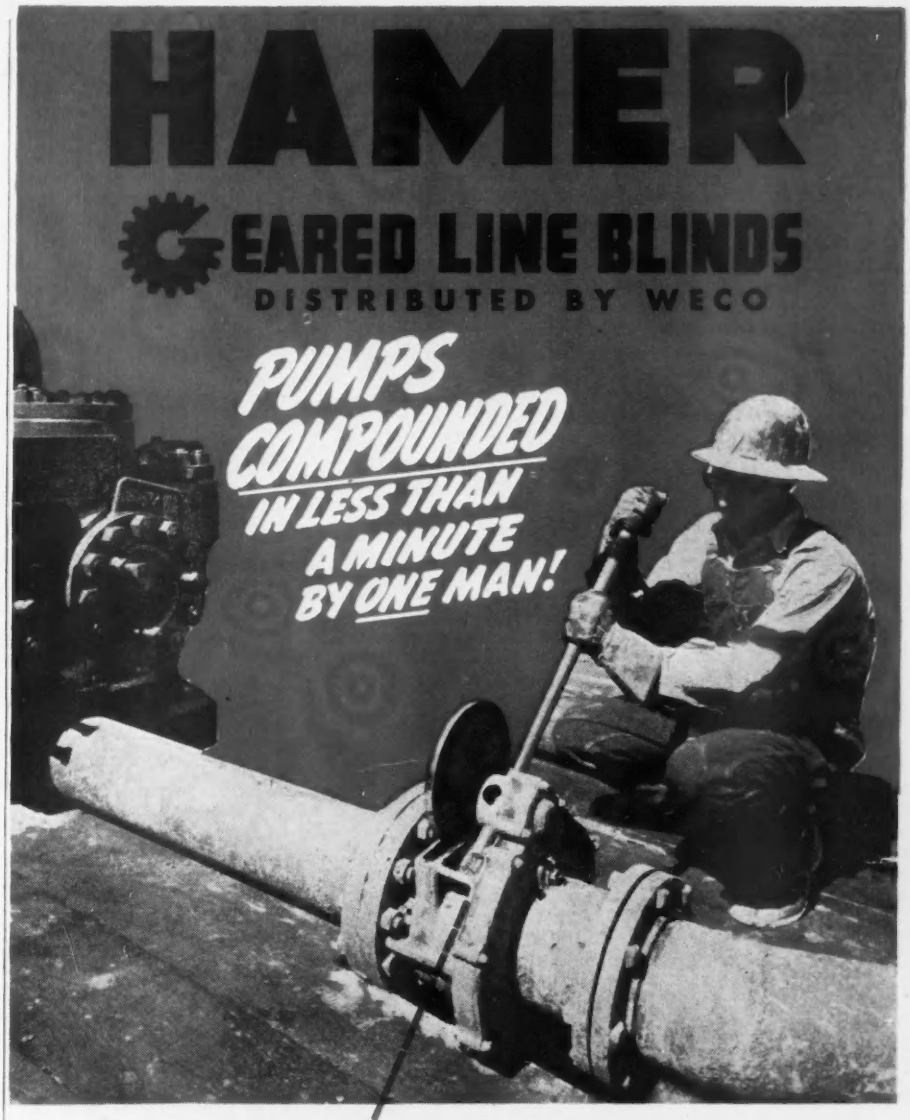
• Arkansas

Fouke Field Deep Prospect To Test Several Good Shows

Deep test at Fouke prepares to test several good shows; Wesson outpost to test in Tokio horizon.

Miller County: The Carter Oil Company's Philyaw 1, C SW SE 36-16s-27w, ¾ mile north of Carter's Sturgis 1, Fouke field discovery, was preparing to make a drill-stem test on several series which carried good showings of oil and gas. The well, bottomed at 7505 feet, will test 2 Travis Peak sands, 3 in the Paluxy and a sand in the Kilpatrick. Either Kilpatrick or Travis Peak production would establish a new pay for the field, which produces from several lenticular Paluxy sands from 3400 to 3700 feet. Philyaw 1 is on an updip on structure. Fouke field is a northeast-southwest fault with upthrown side to the southeast. Production is limited to a narrow belt along the upthrown side of the fault.

Ouachita County: Lyons & Prentiss' G. W. Linkous 1, in NE NE NE 23-15-19, will be perforated and tested, the first perforation being for the Glen Rose sand at around 2630 feet. An electric log test showed good saturation in the Tokio sand below 2350 feet. Success of this test, which seems indicated, would give the Wesson field a ½ mile extension.



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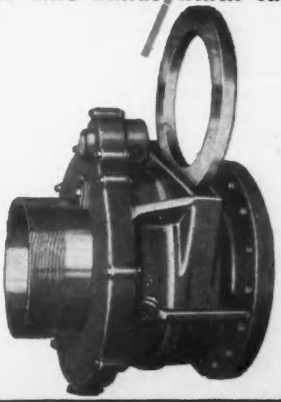

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• Mississippi

Mallalieu Field Extended ¾ Mile Northwest by Sun

Mallalieu field extended northwest by Sun's completion; good prospect in northeastern Mississippi abandoned.

Lincoln County: Sun Oil Company's Summers 1, SE SW 8-6n-8e, has been successfully completed to extend the field ¾ mile northwest. Although the extension was relatively small it is fairly important in that it is a development in a new direction for the field. Since The California Company's F. W. McDaniel 1 moved production southwest last year, much of the fields development has gone in that direction. Casing was drilled out to 10,484 feet in the lower Tuscaloosa and perforated at 10,475½-76½ to initiate production. Later the productive oil sand was perforated at 10,432-75 feet with 344 shots and with packer at 10,378 feet the well flowed 466 barrels per day of 39.1-gravity oil. Tubing pressure was 1010 pounds and gas-oil ratio 370/1. In the southern end of the Mallalieu Humble Oil & Refining Company's Nora Sartin 1, SEc 17-6n-8e, has reached the producing zone in lower Tuscaloosa and after perforating several sections below 10,402 feet, is swabbing. In the Brookhaven field Roeser & Pendleton's Sam Day 1, SE NE 20-7n-7e, has been completed as an excellent producer in the field. Casing was perforated at 10,453-465 feet and on initial test the well flowed 1300 barrels of 31-gravity oil per day. Rogers Lacy's Harvey Smith 1, NE SE 17-6n-7e, is rigging up for an exploratory test about 5 miles west of Mallalieu. The well is scheduled to drive through the Wilcox to the Lower Tuscaloosa horizon at approximately 10,000 feet.

Chickasaw County: Pan - American Production Company's H. B. Carter 1, S&E SE SW 24-12s-4e, northeastern part of the state, has been abandoned at 2642 feet. Prospects driven in this area have encountered numerous shows, but none indicating commercial production. The Carter developed sand with slight odor at 2374-82 feet and 2 drill-stem tests at 2278-507 feet recovered mud cut with gas. Cores at 2601 feet also had good odor and there were shows in stringers at 2641 feet, but none were important.

Adams County: Texas-Pacific Coal & Oil Company's O. L. Wilson 2, SWc 8-6n-2w, LaGrange field, has recovered encouraging shows from the upper section of the Wilcox. Productive zone of the field is the 6200-foot sand of the Wilcox, but cores from 4635-38 feet recovered sand with good porosity and good oil stain. Subsequently, a drill-stem test at 4625-38 feet recovered 30 feet of oil in a 10-minute test. In the same test gas pressure built up to 1750 pounds. In a second drill-stem test at 4635-41 feet the well flowed oil and gas and good pressure was built up. Difficulty may arise, however, from the fact that sections immediately above and below the new producing horizons have heavy indications of salt water. This is the first evidence of commercial production possibilities outside of the field's 6200-foot sand. In the Carthage Point field The Pure Oil Company's L. S. Stanton 1, 11-6n-3w, is drilling below 5867 feet in its drive for the Massive sand. No shows have been noted in the Wilcox section.

Forrest County: The Superior Oil Company's Maria Draughn 1, NEc 12n-3n-13w, wildcat 1¾ miles southeast of the company's Cassie Bradford 1, which has been shut in for several weeks, is drilling below 9565 feet with no shows reported. How deep the well goes may depend on the findings of the Bradford, which have not been announced. Several unconfirmed reports said the Bradford had commercial production in the 13,500-foot zone and also in the Massive sand section below 10,000 feet.

Clay County: The Atlantic Refining Company's R. G. Dunning 1, SWc 12-19n-16e, wildcat in the northeastern section of the state, is drilling below 2000 feet with no shows reported. It probably will go to about 2500 feet.

Alabama

Only 2 wildcats are active in the state and neither has reached potential productive levels. In Marion County Harry L. Cullet's H. V. Lewis, SE NW SE 23-11s-14w, is working with cable tools below 742 feet, and in Morgan County D. I. McNabb & C. P. Mayhall's Bramlett 1, NWc NW SE 7-8s-4w, is drilling below 1657 feet.

In the Gilbertown field The Carter Oil Company's E. A. Rentz 2, SW NW NE 4-10n-3w, is drilling below 3050 feet and nearing producing levels.

Florida

Humble Oil & Refining Company's Gulf Coast Realty Company 9, C SE¼ 24-48s-29e, Sunniland field of Collier County, has shown good possibilities for production after reaching 11,590 feet. After acidizing potentional productive section below 11,560 feet, a drill-stem test was made at 11,546-92 feet and recovered 1080 feet of oil cut with water in 70 minutes. Production string of casing has been set to 11,581 feet and completion rig is being assembled. Humble's Lee Cypress Company 3, SE SE 28-47s-29e, wildcat, is drilling below 9805 feet with no shows reported.

Monroe County: Gulf Refining Company's wildcat, State 1, SWc 2-67s-29e, continues to have encouraging shows below the 14,000-foot level. Cores at 14,526-594 feet indicated dense lime with stringers of dolomite and shows of oil in fractures. Cores at 14,594-648 feet recovered porous lime with slight shows of oil and gas. Drilling continues below 14,711 feet.

IPAA Meetings

The annual membership meeting of the Independent Petroleum Association of America will be held in Oklahoma City, September 29-30.

The mid-year directors' meeting will be held in Jackson, Mississippi, May 8-9 and will feature a panel discussion on oil development and future prospects of the Southeast.

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• Illinois Basin

Knox Dolomite Strike Likely In Knox County, Kentucky

Discovery looms in Clay County, Kentucky; new pool opening in Effingham County, Illinois.

Kentucky

The Pure Oil Company and Stanolind Oil & Gas Company are running casing for a production test at Hammons 1, 22-I-67, wildcat in Clay County, Kentucky.

Approximately 25 miles from nearest production, the well had 2500 feet of oil in the hole as operators began setting pipe. Total depth is 3640 feet. Well was bottomed in Knox dolomite after oil was encountered in 3 or 4 pays not yet identified, starting at 3515 feet.

Illinois

Nu-Enamel Corporation's Adams 1, SW NW SE 10-6n-7e, Effingham County, 3 miles north of the Bible Grove

pool, is ready to make production test of McClosky lime at 2870-78 feet, the latter figure total depth. During a 1-hour drill-stem test, the well yielded 920 feet of oil and 70 feet of oil-cut mud.

Marion County: Ralph Halbert's Price 1, SW NE SE 28-1n-2e, wildcat farmout from Kingwood Oil Company, is pump testing Rosiclare at 2123-38 feet, and is making approximately 10 barrels of oil daily.

Wabash County: F. J. Fleming's Berberich 1, SE SE NW 26-1s-14w, a mile east of the Browns pool, is showing for one of the best wells in the area. Completed in January for 250 barrels of oil, the well was reopened and acidized with 3000 gallons, after which it made 854 barrels the first 24 hours, 808 barrels the second 24 hours, and 806 barrels the third 24 hours. It is producing from McClosky lime at 2965-75 feet.

White County: Watkins Drilling Company's Apple 1, NW NE NW 32-5s-9e, is drilling below 2820 feet after a drill-stem test of Hardinsburg sand at 2631-46 feet showed commercial possibilities. The well also carried a show of oil in Tar Springs sand at 2445-60 feet, but the pay yielded only oil-cut mud during a brief drill-stem test.

• Michigan

Sun's Newaygo County Wildcat Is Probable Field Discovery

Prospects for active spring drilling campaign brighten with probable field discovery in Newaygo County; Cato play activity brisk; Deep River field extension try fails.

Newaygo County: Sun Oil Company's Linderer 1, SW SW SW 11-12n-13w, Garfield Township, flowed 210 barrels oil in 9 hours from Traverse lime contact pay at 2331-33 feet after being shut in 50 hours. Later it flowed 170 barrels in 12 hours while being deepened to 2335 feet.

Sun's wildcat is about 15 miles southwest of the Goodwell field and 30 miles southeast of the new Stony Lake play in Oceana County. The wildcat was drilled on geological information supported by shallow core drill information. Sun controls the bulk of the acreage in the area.

Montcalm County: Two rigs are in and 4 other locations have been surveyed in the revived Cato play, following The Ohio Oil Company's mile southwest extension completion on the Moyses 1, SE NE NW 9-12n-8w, flowing an average of 100 barrels daily under choke from 3534-foot Monroe lime pay.

Arenac County: Joe E. Bauer's Turek 1, NW SW SW 19-19n-5e, mile southeast extension bid to the Deep River field, topped Dundee objective at 2776 feet and was ordered abandoned at 2973 feet after picking up water.

• Ohio

Madison Township Is Given Flowing Well From Clinton

Madison well flows; Sayre pool extended south; North Brush Creek gets extension; Monroe has second gas well; Upper La Grange extended west.

Perry County: B. G. Bartley et al moved 1600 feet southwest of Harkness 1 to complete a better well on E. E. Hoover 1, NW SE 22, Madison Township. Clinton sand at 3330-75 feet had a good showing of oil and gas, and after a heavy shot flowed 77 barrels in 24 hours with 300,000 cubic feet of gas.

Another Clinton sand gas well was drilled in and tubed in the Sayre pool in Bearfield Township. The well is F. R. Beasley et al's J. J. Ketcham 1, NE NE 27, ¾ mile east of the Anna Alton 1 and ½ mile south of the Jesse Ketcham 1. The sand was found at 3956-94 feet with a gauge of 1,200,000 cubic feet when tubed.

Muskingum County: The new gas pool in the north part of Brush Creek Township was again extended, this time ½ mile west by Salem Petroleum Production, Inc.'s H. D. Stockdale 1, SW NW 15. Clinton sand at 3740-80 feet gauged 681,000 cubic feet natural.

Knox County: H. E. Perkins has finaled his second gas well in the eastern part of Monroe Township. The well is John Henwood 2, Lot 9, gauged at 600,000 cubic feet natural from the Clinton sand at 2566-83 feet.

Lorain County: Ohio Fuel Gas Company's B. M. Aldrich 1, Lot 45, La Grange Township, was completed at 800,000 cubic feet natural. The gas was found in a thin Clinton sand lens at 2344-49 feet, 40 feet above the lens in the Shelden well ½ mile east.

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• California

Kern County Salt Creek Field Is Given South Extension

Salt Creek field extended ⅓ mile south; completion in schist at Edison flows 1850 barrels; new Kern County wildcats attract interest; Trico gas field west flank test is good for 7 million cubic feet; Middle Dome discovery flowing 38 percent salt water; first wildcat gets under way on 7000-acre lease in San Luis Obispo County.

Kern County: Miller and York have extended the Salt Creek field about ⅓ mile south with Anderson 1 in 20-29s-21e. Drilled and abandoned early last year when it failed to find the pay, the well was recently surveyed and redrilled. It came in from a redrilled depth of 2381 feet flowing 200 barrels of 20.5-gravity oil through 10/64-inch choke. Production is consistent with that of other wells completed in the Temblor oil zone discovered in this field last year by Independent Exploration Company.

An attempt is now being made by Independent Exploration and Oceanic Oil Company to extend the field west by drilling a joint test, Roco 1, in 18-29s-21e.

Renewed interest was given schist zone development in the Edison field with completion of Dougherty 9 in 14-30s-29e by H. H. Magee, Operator. Located on the north flank of the field, the well flowed initially 1850 barrels of 19.5-gravity oil through ½-inch choke. The completion proves up several locations. Total depth is 2606 feet, with top of schist placed at 2495 feet.

A wildcat play is reported about 1 mile southeast of the Edison field, where M. N. Young and Jack McKeon, independent operators, have leased 1000 acres centering around 29-30s-30e.

Two wildcats to be drilled in the near future have attracted attention. The British American Oil Producing Company will drill Government 66-20 in 20-30s-24e about 1 mile north of production in the Elk Hills Naval Reserve. In the McKittrick area, Woodward and Reynolds, engineers, are acting as agents for a yet unidentified concern which will drill a test well in 19-30s-21e. This is about 7 miles west of the town of McKittrick.

Tulare County: Lebow and McNee, McDonald 1, in 15-28s-28e, west flank of the Trico gas field, has been completed flowing 7 million cubic feet through ½-inch choke with 800 pounds flow pressure. Production is from the first Mya sand. The lower Atwell Island sand was wet, but showings were sufficiently encouraging to justify further prospecting. The well is about 1¼ miles southeast of the company's recently abandoned Hacienda 1 outpost test. The McDonald well extends production west about 1100 feet. A second well is scheduled for early spud on this lease.

A. E. Hart has staked a wildcat in the Terra Bella area 34-22s-27e where there has been a revival of interest in shallow prospecting.

In the Earlimart area, 22-23s-26e, The Superior Oil Company has spudded Day 24-22, a wildcat, about 1 mile southeast of a dry hole drilled by Seaboard Oil Company.

Kings County: Middle Dome Corporation 73-30V, Eocene discovery well on the Middle Dome of Kettleman Hills, is flowing 400 barrels gross, 38 percent salt water, through 22/64-inch choke. Standard Oil Company of California, Operator, will undertake a remedial program, but will let the well flow a while "to see what happens." Initial production was clean.

San Luis Obispo County: Union Oil Company is preparing to drill Vernon Wineman 1, a wildcat test 6 miles north of the Santa Maria field on the Rancho Nipomo. The company has a 7000-acre lease.

Los Angeles County: A series of formation tests in General Petroleum Corporation's deep test, La Mirada Community 46-1 southeast of the Santa Fe Springs field in 16-3s-11w, have not been encouraging, but further tests uphole will be made before abandoning. Total depth is 12,629 feet.

California to Operate Field

Operation of the Wilson Creek field, second largest producer in Colorado, was assumed by The California Company March 1. This field was a discovery in 1938 and has been operated by The Texas Company, under joint agreement with California. Under terms of the field unit either company may elect to operate the field in successive five-year terms. The field now produces approximately 6500 barrels daily of light oil from the Morrison and Sundance sands, and has been tested to the Weber formation, productive in the Rangely field, 25 miles north.

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• Rocky Mountain Area

Herrick Dome in Wyoming Reported to Have Strike

Superior's Herrick Dome wildcat is unofficially reported to be discovery; test fails in Lysite area wildcat; Freezout Creek, Colorado, prospect abandoned; Rangely field extension try running high on Weber, Prowers County test is drilling in Arbuckle.

Wyoming

Official information has been lacking for 2 weeks on The Superior Oil Company of California's Herrick Dome wildcat, Herrick 1, SW NW SE 1-16n-76w, Albany County, 20 miles west of Laramie in the southern end of the Laramie Basin. However, unconfirmed reports are that a discovery has been made. Tensleep sand was reported topped at 3642 feet and a drill-stem test 2 weeks ago showed 2150 feet of 20-gravity oil on 1-hour test. It is now reported that casing has been run to top of sand and the well swabbed 100 barrels of oil in 3 hours and made 260 barrels of oil per day on pump. This structure is 5 miles east of Quealy Dome field, which has produced since 1934 from Dakota and Sundance horizons, and was a discovery in the Tensleep early this year. The Herrick test found water in Sundance topped at 2431 feet and showed water in the Dakota when drilled by Union Oil Company of California in 1928. Union abandoned it at 2200 feet after testing the Dakota. The structure is small and has little closure, but renewed drilling activity is now expected on several similar structures.

Fremont County: After running 7-inch casing to 12,587 feet, Sinclair Wyoming Oil Company cored an additional 13 feet on Unit 1, NE NE NW 35-39n-91w, Lysite wildcat. On a drill-stem test at 12,540-600 feet the recovery was 800 feet of drilling mud, and the well will now be perforated opposite gas sands at 9000-11,000 feet. This is the second deepest test in Wyoming, failing by almost 300 feet to equal the record established last year by Mountain Fuel Supply Company at Church Buttes in the southwestern part of the state.

Colorado

The third test of the Freezout Creek area in southeastern Colorado is being abandoned by the J. M. Huber Corporation of Borger and Frontier Refining Company of Denver. The well is Ingle 1, SW SW SE 27-29s-50w, Baca County, and was drilled to 4947 feet. Formation tops and tests have not been released by the companies on any of the 3 wells drilled, but it is believed that the drilling program is completed for the time being. The well is midway between Murray 1, SW SW SE 26-29s-50w, which went to 5605 feet, total depth, and Jacobson 1, SE SE SE 28-29s-50w, abandoned at 3622 feet. Sharples Oil Corporation of Denver was a participant in the first 2 wells, but withdrew from the campaign. These wells have been drilled on a 125,000-acre block along the western side of the county. The play was based on possibilities of stratigraphic traps of lower beds against the Las Animas Arch, along the north rim of the Anadarko Basin.

Rio Blanco County: In the Rangely field, an extension test at J. E. Pepper 1, SW SE NW 31-2n-101w, on the east side of the field, is running more than 50 feet higher than expected on the Weber sand. The well topped Weber at 6075 feet and is coring in that formation. This test is more than a mile east of production. Another test on this side of the field is being commenced by Delta Drilling Company of Tyler, Texas, and Mountain States Petroleum at Kelley 1, Lot 8-33-2n-101w. This well is more than 3 miles east of production.

Prowers County: The only active drilling operation in southeastern Colorado is drilling in the Arbuckle formation below 6250 feet. The well is The Ohio Oil Company's Two Buttes test at Eldridge 1, NW NW SW 25-27s-46w, and although small shows of gas have been encountered, there have been no tests reported of commercial value. The well is testing a 40,000-acre block assembled by Ohio and thoroughly worked by geophysical methods prior to drilling. The well is reported running higher than expected.

Montana

The most severe winter in the recent history of northern Montana has almost entirely shut down operations in the Kevin and Cut Bank fields. However, The Texas Company has managed to keep drilling in its 2 deep operations in the Bowdoin Dome area and at Bears Den. The Bowdoin test, at Unit 1-822, C SW SW 8-32n-32e, Phillips County, is reported drilling below 5580 feet and the last formation reported was Devonian at 4000 feet. In Liberty County, at Bears Den, 180 miles west of Bowdoin, the same company's Sorrell 1, C NE NW, 29-36n-6e, is drilling below 4900 feet after logging a small show of gas in the Jefferson formation (Devonian) topped at 3955 feet.

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■ NEW PRESSURE GAGES — For Water, Steam, Oil, Air, etc.: In original Sealed Factory Cartons. 300 Clapp #400. Phenol case, back mounting, Bourdon Tube type. 0-1000 lb. pressure. 10 lb. graduations on 4½ in. face. ½ in. connection. Price $7.00 ea., $6.00 ea. in dozen lots.

175 Ashcroft #1279 E. Phenol case. 0-1000 lb. pressure. 10 lb. graduations on 4½ in. face. Duragauge steel tube, ½ in. connection. Price $8.00 ea., $7.00 ea. in doz. lots.

175 Ashcroft #1079 E. steel case; other specifications same as #1279 E. Price $9.00 ea., $8.00 ea. in doz. lots. F.O.B. Tulsa, Okla. MIKE A. TRAVIS, P. O. Box 1343, Tulsa, Oklahoma.

■ FOR SALE—Model F Franks core drill, also equipped to drill water wells, mounted on 1½ ton 1942 Ford truck and 1½ ton 1940 Ford water truck with 400 gallon tank and Tulsa winch. Priced to sell immediately. Call or write R. F. Dome, 2412 West 7th, Great Bend, Kansas, Telephone 874.

NEW MATERIAL FOR SALE

50—4"x25' Barge Hoses equipped with Bronze Male & Female Couplings at $35.00 each.

Several thousand Victaulic Coupling Gaskets, size 4"-6"-12". 5000 gaskets for 8" Single Lever Type Rapid Action Coupling Pipe at 50 percent discount.

6 Centrifugal Pumps, unitized, 1000 G.P.M., powered by 33-R Continental 6 Cylinder Engine at $1250.00 each.

1 — Water Purification System, 80 G.P.M. with Chemicals, Accessories, Wood Tanks, Fittings and Valves. Semi-Portable, at $2500.00.

250—5 9/16" Hughes Full Hole left hand API Tool Joints—with API Pipe Ends, 7" O.D. -4" Bore at $10.00 each.

Wire or Write
ATLAS SUPPLY COMPANY
P.O. Box 1331
Bakersfield, California

NOTICES

■ For nine years I have been experimenting and running tests on a new type geophysical instrument that designates favorable and unfavorable oil possibilities. "Science" says it won't work but repeated tests prove it does! Am now interested in contacting an operator with capital to take over a particularly favorable four-thousand acre block and drill a well. Will accept either a fee or an over-riding interest. Contact A. W. Burnitt, 513 Chronicle Building, Houston, Texas.

HELP WANTED

■ WANTED: Geologists for foreign assignment. Must be capable of accurate surface detail with plane table and should have at least three years experience in this type of work. Address: Box 10, c/o The Oil Weekly, Houston, Texas.

Magnolia Announces Transfers In Production Department

Magnolia Petroleum Company announced the following transfers in the production department, effective March 1:

E. L. Downing to Dallas as assistant general superintendent of production; F. R. Corbell to Houston as assistant superintendent of the Gulf Coast Division, succeeding Downing; C. E. Taylor to Alice, Texas, as superintendent of the district, succeeding Corbell; and Harvey Lee to Brownfield, Texas, as superintendent of the district, succeeding Taylor.

The company's Jackson, Miss., district office has been closed.

Industry Will Develop New Chemicals, Fash Declares

R. H. Fash, vice president of The Fort Worth Laboratories and guest speaker at the February 17 meeting of the Fort Worth Geological Society, reviewed the growth of the petroleum industry in the organic chemistry field. He predicted that cracked gases obtainable at refineries and raw materials to be derived from natural gas will continue to yield new products that will serve as the foundation for one of the nation's greatest chemical industries. He stated that the petroleum industry will have accomplished much in the field of organic chemicals before atomic power becomes competitive with petroleum produced power.

SITUATIONS WANTED

■ PETROLEUM ENGINEER: Danish graduate engineer, age 27, married, interested in position as supervisor in oil field, pipe-lining or exploratory work in Europe or North Africa. Two years field experience with large American oil company. Speaks English and German perfectly, knowledge of French, Spanish and Italian. Address: S. A. Schaumburg-Jensen, Sophiendal, Skanderborg, Denmark.

■ Former Assistant Attorney General of Texas and previously identified for several years with legal and land departments of major oil production and refining companies in New York, Oklahoma, Texas, and Mexico; well rounded experience in all phases, including records and titles; entirely familiar with Railroad Commission's allowable estimates, reports, etc. Middle aged; active; adaptable and efficient. Address: Box 11, c/o The Oil Weekly, Houston, Texas.

WANTED TO BUY

■ Will buy producing oil properties out-right or operating interest. Want proven or semi-proven shallow acreage to drill. Phone C 4-3121, Box 835, Houston 1, Texas.

LEASES, DRILLING, ACREAGE, ETC.

■ JOHN O. BANKS pays top prices for producing royalties, 302 Gilbert Bldg., Beaumont, Texas.

■ Invite inquiries from firms or individuals interested in financing the development of oil and/or gas production; or financing the drilling of wells for oil and/or gas payments. We have fairly good farmouts submitted to us from time to time which are more than we can handle ourselves. We are producers of oil and gas; also drilling contractors. Address: "Contractors," c/o The Oil Weekly, Houston, Texas.

■ Would like some financial assistance in shallow territory. Address W. J. Anson, 516 Egan Street, Shreveport, Louisiana.

MAPS

■ PERMIAN BASIN "EXECUTIVES MAP," 1947 edition. Shows sections, surveys, wells, dry holes & depths in blue; field names, formation, depth, discovery year, number wells in red; larger lease blocks, expiration year in green. 1 in.-5 mi. 3x4 ft. $7 50. Illustrated folder on request. SOUTHWEST MAPPING COMPANY, 1101 Ft. Worth Nat'l Bldg., Ft. Worth, Texas.

EXPLORATORY FAILURES

CALIFORNIA WILDCATS

Santa Barbara County: Union Oil Co.'s Purisima 46, 14-7n-34w, Lompoc area, abnd 2-16-47 at 3549.

Los Angeles County: Seaboard Oil Co.'s Mission Land 8-1, 25-3n-16w, Newhall area, abnd 2-18-47 at 9528.

Kern County: Elmer C. von Glahn's Hooper 1, 36-26s-27e, Mount Poso area, Vedder 2396, abnd 2-18-47 at 2416.

Rothschild-Bender Oil Operations' Anderson 4, 20-29s-21e, Cymric area, Oceanic 4472, Kreyenhagen 4495, abnd 2-17-47 at 5277.

Harp and Brown's Quinn 1, 11-25s-27e, Jasmine area, Olcese 1428, Jewett 1755, Pyramid Hills 1915, Grit 2051, Vedder 2069, Walker 2188, Granite 2254, abnd 2-14-47 at 2347.

Albert Angus' Tejon 1, 19-32s-30e, Comanche Point area, abnd 2-16-47 at 534.

COLORADO WILDCATS

Baca County: Huber-Frontier's Ingle 1, sw sw se 27-29s-50w, Freezout Creek, abnd 2-21-47 at 4947.

Huerfano County: Mid-Alamo Oil's Bartlett 1, ne sw nw 27-27s-68w, Badito-Alamo, Dakota 2508, Morrison sand 2782, abnd 2-15-47 at 2791.

FLORIDA WILDCAT

Alachua County: Tidewater's R. H. Cato 1, c se sw 23-8s-18e, abnd 2-14-47 at 3146.

ILLINOIS WILDCATS

Jasper County: L. A. Gruelling et al's Morgan 1, sw se nw 8-5n-8e, abnd 3090.

Madison County: Smith & Coyle's Johnson 1-A, se ne se 6-3n-5w, abnd 986.

Perry County: B. A. Baker's Nehring 1, se ne nw 6-4s-1w, abnd 1406.

Richland County: W. P. Mueller's Minderman 1, sw ne ne 11-3n-11w, abnd 1926.

Fryer-Simson Drlg. Co.'s Drewes 1, ne nw nw 13-4n-10e, abnd 3105.

White County: W. C. McBride's Berkhart 1, ne se sw 34-4s-9e, abnd 3423.

INDIANA WILDCATS

Clay County: P. A. Wilson's Downs 1, ne se ne 2-13n-6w, abnd 420.

Knox County: H. E. Ledbetter's Bloom 1, se se nw 32-1n-11w, abnd 2325.

KANSAS WILDCATS

Barber County: Globe O & R Co. et al's Smith 1, ce½ ne ne 10-32s-12w, abnd 4707.

Barton County: Helmerich & Payne et al's Davis 1, nw nw sw 32-16s-14w, abnd 3719.

Graham County: Derby Pet. Co. et al's Swenson 1, sw sw sw 8-9s-21w, abnd 3934.

Rooks County: Royer & Farris' Eggleston 1, ne ne ne 33-10s-18w, abnd 3670.

NORTH LOUISIANA WILDCATS

Bossier Parish: J. B. Blanchard's W. C. Upton 1, 34-20n-11w, base Annona 1695, Blossom 1935, Tuscaloosa 2550, Paluxy 2660, Glenrose 2850, abnd 2-24-47 at 2925.

Claiborne Parish: F. B. King's Maritzky 1, c w½ sw nw 27-23n-6w, Cretaceous 1986, base Annona 2652, Anhydrite 2779, Massive 3952, base Massive Anhydrite 4150, Pettit 5197, abnd 2-21-47 at 5200.

De Soto Parish: C. H. Murphy, Jr.'s, Edwards 1, 1980 fr sl 660 fr el se 16-13n-14w, abnd 2-22-47 at 4330.

Sabine Parish: Richard W. Norton, Jr.-Mrs. Annie Norton's La. Long Leaf Lbr. Co. 1, sw nw 13-16n-13w, abnd 2-8-47 at 5492.

SOUTH LOUISIANA WILDCATS

Acadia Parish: Phillips' Hoffpauer 1, sw¼ 16-10s-1e, 1½ mi sw Crowley oil prod, abnd 2-21-47 at 10,024.

Sun-Sohio's Gardiner-Chiasson 1-A, 2339 s 928'e of nwc 4-10s-2w, 1¼ mi sw prod, abnd 2-11-47 at 10,750.

MICHIGAN WILDCATS

Kent County: Rex O & G Co.'s Buddingh 1, nw ne se 28-5n-12w, abnd 2-14-47, at 1773.

Lake County: Sohio's Wilson 1, ne sw ne 20-19n-11w, Dundee 3406, abnd 2-12-47 at 3599.

St. Clair County: Frank W. Pott's Ogden 1, nw nw ne 9-7n-17e, abnd 2-20-47 at 738.

Wayne County: Byron MacCallum's Gumtow 2, (OWDD) n½ sw nw 17-4s-9e, otd 2200, abnd 2-19-47 at 2880.

MICHIGAN OUTPOST

Arenac County—Deep River: Joe E. Bauer's Jurek 1, nw sw sw 19-19n-5e, 1 m southeast prod, Dundee 2776, abnd 2-21-47 at 2973.

MISSISSIPPI WILDCATS

Chickasaw County: Pan-American's H. B. Carter 1, s&e nwc se sw 24-12s-4e, lime 392, Eutaw 520, Tuscaloosa 748, Mississippian 2340, abnd 2-17-47 at 2642.

Washington County: Warren Pet. Co.-Tidewater's State Park 1, nec 8-15n-7w, abnd 2-15-47 at 5501.

OHIO WILDCAT

Coshocton County: Ohio Fuel Gas Co.'s Ethel Crowthers 1, nw nw 9, Perry Township, abnd 2-15-47 at 3169.

OKLAHOMA WILDCATS

Choctaw County: E. T. Johnson's Knight 1, nw nw ne 26-7s-15e, abnd 649.

Cimarron County: Stanolind's Lathrop 1, cnw se 11-3n-8eCm, abnd 5100.

Comanche County: Frank Woods' Marris 1, se se ne 2-1s-11w, abnd 2502.

Cotton County: Kingwood Oil Co.'s Gandy 1, sw se sw 28-2s-11w, abnd 1905.

R. E. Berlington et al's Scherler 1, se se sw 15-2s-13w, abnd 2200.

Akin & Dimock's Wolfe 1, ne ne sw 21-3s-11w, abnd 2015.

Carr Oil's Hooker 1, sw nw sw 12-3s-12w, abnd 1623.

Jess Harris et al's Scruggs 1, sw se se 22-3s-13w, abnd 2367.

Hedrick & Howell's Brinlee 2, nw nw nw 13-4s-11w, abnd 1505.

M. P. McLaughlin's Suddeth 1, nw nw nw 1-5s-11w, abnd 2505.

Jackson County: G. L. Tatums' Vistal 1, se se se 25-3n-21w, abnd 3205.

Kingfisher County: Atlantic's Vilhauer 1, sw ne nw 22-18n-9w, abnd 9640.

Okfuskee County: Smith-Horton Drlg. Co.'s Weldon 1, sw sw ne 17-12n-9e, abnd 4047.

Oklahoma County: Sunray et al's Cole 1, ne ne sw 2-13n-1e, abnd 5806.

Seminole County: Norbla Oil Co.'s Reed 1, nw ne ne 2-5n-7e, abnd 3031.

Stephens County: B. D. T. Oil Co.'s Land Bank 1, se ne se 15-1n-6w, abnd 2522.

Tillman County: J. S. Batson's Sparks 1, sw sw sw 11-2s-16w, abnd 1970.

Consolidated Oil Co.'s Stack 1, ne ne sw 17-4s-15w, abnd 2667.

Danciger O & R Co.'s Beard 1, ne ne se 19-4s-15w, abnd 2553.

W. G. Gouchie's Wilson 1, ne ne ne 18-1n-18w, abnd 1124.

WEST TEXAS WILDCATS

Crane County: Byrd & Frost's Eppenauer 1, c n¼ of w¼ H&TC 20, blk 6, elev 2344, Yates 1100, San Andres 2100, Clear Fork 3090, detrital 5175, Simpson 5260, Joins 5775, Ellenburger 5855, abnd 2-17-47 at 6003.

Dawson County: John Pringle-King & Warren's Stewart 1, c sw sw E. L. & R. R. 105, blk M, elev 3064, Yates 3060, brown lime 4128, San Andres 4810, abnd 2-16-47 at 5270.

Scurry County: M. H. Crabb et al's Winston-Magnolia 1, 1210 ewl 330 nsl lot 91, blk 35, Kirkland & Fields sur, elev 2310, lime 1580, abnd 2-19-47 at 1955.

NORTH TEXAS WILDCATS

Archer County: Underwood Drlg. Co.'s Campbell 1-M, 150 out nwc se¼ sect 1373, T E & L Co. sur, abnd 2-11-47 at 1100.

Cooke County: McCurdy Bros.' Cunningham 1, 150 out nwc John T. Hill sur, elev 696, abnd 1952.

B. L. Hoover et al's Gimple 1, 150 snl 1580 ewl of John Scanland sur, elev 804, Ellenburger 1531, abnd 2-21-47 at 1596.

Jack County: A. R. Dillard et al's Marley 1, (OWDD) se se ne W. C. Ry. 4, A-984, OTD 3434, Palo Pinto 1125, Bend 4387, Ellenburger 5440, abnd 2-24-47 at 5456.

S. D. Johnson et al's Lindsay 1, 2370 ewl 5700 nsl I. N. Wright sur, elev 938, abnd 2-13-47 at 3415.

Montague County: Nu-Enamel Oil Operating Co.'s Perry 2, 280 fr nw 1650 fr ne L. S. Farrer sur, elev 1266, abnd 2-14-47 at 1874.

NORTH CENTRAL TEXAS WILDCATS

Callahan County: G. C. Tisdale et al's Seale 1, 200 wel 170 nsl J. C. Yates sur 7, abnd 2-16-47 at 1250.

Jones County: Alder Oil Co.'s Pope 1, 1240 snl 1980 wel S. P. Ry. 16, blk 12, Saddle Creek 2348, Bluff Creek 2367, coal 2397, Flippen 2410, abnd 2-14-47 at 2934.

Hedrick Oil Co.'s Howle-Texaco 1, 330 fr sw sel nw¼ T & P Ry. 17, blk 16, elev 1667, abnd 2-14-47 at 2531.

E. H. Wahl et al's Meadows 1, 2800 nsl 330 ewl W. R. Evans sur 1, elev 1611, abnd 2-11-47 at 3788.

Taylor County: Texas Co.'s Hamilton 1, 330 nsl 3950 ewl J. W. Page sur, abnd 2-22-47 at 3010.

EAST CENTRAL TEXAS WILDCATS

Collin County: Standard of Texas' Newsome 1, 467 n 467 w of nwc W. C. Lewis sur, but in John W. Cox sur, elev 763, Goodland 1460, base Cretaceous 2765, Ellenburger 7470, abnd 2-16-47 at 8261.

Hill County: A. P. Merritt et al's Henry Nors 1, 825 fr swl 2000 fr nwl 99¼-ac tr and F. A. Tabor sur, elev 535, Pennsylvanian 1680, abnd 1-30-47 at 3127.

Navarro County: Dail Goodson and John Hooser's McDowell 1, 750 fr sel 2950 fr swl T. J. Jordan sur, elev 395, Woodbine 3180, abnd 2-15-47 at 3762.

SOUTH CENTRAL TEXAS WILDCATS

Caldwell County: C. W. Voyles' Euphemia Thomas 1, 330 fr nl 3095 fr wl Jeremiah Roberts sur 127-ac lse, Navarro 469, Taylor 1010, Austin Chalk 1744, Eagleford 1977, Buda 2006, Edwards Lime 2140, abnd 2-11-47 at 2141.

McMullen County: W. W. Hawkins' Nueces Ld & Livestock Co. 1, 990 fr nel 2310 fr nwl John T. Morehead sur 235, 1004-ac lse, 5 mi n Munson fld, abnd 2-3-47 at 1802.

Harry Ezzell's Harry Ezzell 3-A, 330 fr s&wl sect 39 Hays Ezzell sbdn, H. M. Brewer sur 7, 1 mi s sw Ezzell fld, abnd 2-11-47 at 1995.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Hidalgo County: Ernest Cockrell, Jr.'s Lloyd M. Bentsen et al 1, 1448-ac lse, Porc 50, 7 mi sw Mission, 1700 ne Rio Grande River, abnd 2-12-47 at 8505.

Starr County: Dan Auld-Ray Boyd's Ramos Heirs 1, 330 fr sw&sel sur 149 and 367-ac lse, abnd 2-14-47 at 1330.

Webb County: Gravis & Mitchell's A. M. Bruni Est. 1, 330 fr se&nel blk 167 O. W. Killam sbdn El Ranchito tr, 640-ac lse, Jose Borrego Gr, 11 mi s Mirando City, abnd 2-14-47 at 3003.

UPPER TEXAS COAST WILDCATS

Ft. Bend County: General Crude's Cora Slavin et al 1, 330 e&n fr sec Mrs. Eliz. Harrison lse to lcn on same lse ¼ mi sw Thompson, 9000 w of N. Thompson prod, abnd 2-14-47 at 8508.

Matagorda County: Skelly's Albert F. Gest 1, 660 fr nl 714.5 fr e&wl 71.14-ac tr, H. Gosling sur, 1½ mi se E. Bay City prod, abnd 12-15-46 at 12,051.

WYOMING WILDCATS

Natrona County: K. S. Albert's Brewer 1, nw sw nw 33-36n-83w, Sulphur Springs, Shannon 954, abnd 1-13-47 at 1030.

Niobrara County: Shell's Nies-Gov't. 1, se ne ne 29-35n-65w, Manville area, Dakota 3140, Sundance 4753, Basal sand 5073, abnd 2-18-47 at 5175.

PORTABLE Gravity Meter

Accurate to .01 of a milligal—compact and light, can be carried by one man on back-pack or mounted in rear seat of sedan or jeep and readings made without removing from car. Write for complete details and sale or lease plan.

NORTH AMERICAN GEOPHYSICAL CO.

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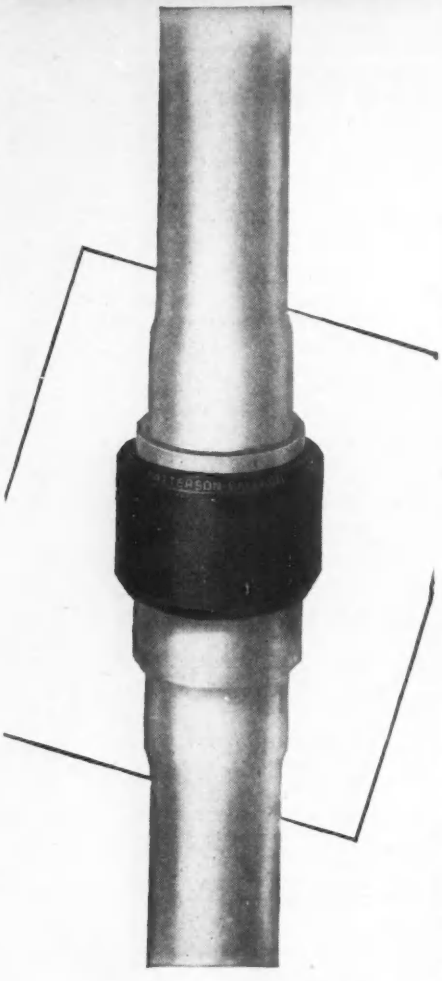
HOUSTON 6, TEXAS

"Best Bet Yet"



SAVE YOUR TUBING!

Tubing collars worn by contact with casing steal the profit out of pumping. Patterson-Ballagh Plastic Tubing Protectors prevent both collar and casing wear. Oil-proof, wear-resistant, insulating. They are pressed onto the collar under pressure and will not come off. Made in all sizes. End your tubing troubles. CALL in your Patterson-Ballagh man.

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SQUEAKS from the BULL WHEEL

Hints for Householders

A certain man came into possession of proof positive that another fellow was what is politely called running around with his wife.

The injured party, being a man of intelligence and disliking violence, sent the intruder a letter inviting him to come to his office the following Tuesday so that they could discuss the unfortunate situation like civilized beings.

The following day he received this reply: "Dear Sir—Your form letter received. Regret that I will be unable to attend the meeting, but rest assured that whatever course the other fellows decide on will be okay with me."

Reverse English

"Oh, Jimmy, you're so slow!"
"I don't get you."
"That's what I mean."

Broad-Minded

"Let's park."
"Listen, I told you I was a lady."
"Aw, to heck with your past!"

Lady in the Dark

"I think your husband dresses nattily."
"Natalie who?"

Time Marches On

"It says here that Apollo was chasing a nymph and she turned into a tree."
"Lucky guy. The ones I chase usually turn into a jewelry store."

Slips That Pass

Want Ad: Lady wishes position as housekeeper for widower. No objection to having one child.

Life Is Like This

She was on her way home from a first aid course when she espied a man lying on the sidewalk, his face cradled on one arm, and the other arm twisted under him in a peculiar fashion.

Without a moment's hesitation, heedless of the gawking bystanders, she leaped astride him and began applying artificial respiration.

After several minutes of this, the victim spoke up: "Lady, would you please quit tickling me? I'm trying to hold a lantern for this fellow down in the manhole."

It Happens Every Time

"John, what happened at the stag dinner tonight?"

"Nothing much. Sam told a dirty joke and old man Drayne got up and walked out in a huff."

"Why, how perfectly noble of him! You men should be ashamed. Er—by the way, dear, what was the dirty joke?"

Sure Sign

The traveling salesman usually arrived home during the day time from his lengthy trips, but on one occasion he returned at midnight and went to bed without waking the family.

A little later his small daughter arose and went to the bathroom. In a moment she rushed back into her mother's bed chamber, shouting happily: "Mother, Mother, wake up! Daddy's home—the seat's up!"

Just Among Friends

Harold J. Cook, consulting geologist, Agate, Neb., writes: "I read the heading at the top of page 58, The Oil Weekly, February 17, to a friend:

"'Arkansas Wildcat Has Production from Tokio.'

"He replied: 'Damn deep well!'"

Editor's Note: Another one on our innocent head writer, which apparently went unnoticed, appeared several months ago like this:

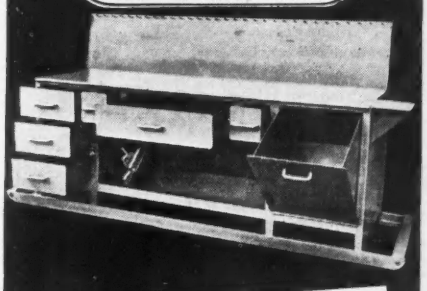
WILDCAT RUNNING HIGH ON VIOLA.

Fun on the Farm

R. E. Floyd of Gar-Flo Oil Company, Conroe, Texas, writes in about the time the late Judge Mahaffey, a prominent jurist in Bowie County, sent his son, Burton, out to the farm to tell the negroes about the hard times that had descended on the land. Mahaffey called the hands together, mounted the steps of the commissary, and told them: "There's a lot of meat, lard, sausage, bacon, salt and pepper in the commissary and you can have all you need. But there is no cloth and no money to buy it with. Now if you want to go to work and raise another crop it is up to you."

Sally, a big, jovial Negro, spoke up in a loud voice: "Mistuh Burton, when you come back down here in the spring, you is going to see the fattest, nakedest buncher niggers in creation."

OWEN



Type "A" Work Benches
Finest in the Field!

Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.

They're the finest in the field for saving tools and providing a safe, convenient working space. Put one on each rig you operate . . . they'll "dress up" its efficiency and appearance.

SOLD THROUGH ALL SUPPLY STORES

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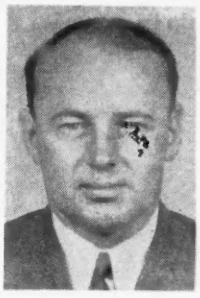
HOUSTON, TEXAS

J. L. Mathieu



W. J. Gillingham

J. L. Mathieu, vice president and general manager of Schlumberger Surenco, is being appointed vice president and general manager of Schlumberger Overseas, operating in the Near and Far East. **W. J. Gillingham,** Louisiana Division manager of Schlumberger Corporation, is being appointed vice president and general manager of Schlumberger Surenco, and is to reach Caracas, Venezuela this month. **E. Souchon** and **A. J. Stoll** remain respectively vice president-in-charge-of-operations and secretary of Surenco. **A. Claudet,** manager of field operations at Houston headquarters, has been appointed division manager of Schlumberger Well Surveying Corporation, with headquarters at New Orleans, replacing Gillingham.

»

Grady H. Vaughn, Dallas producer and drilling contractor, is confined in a Dallas hospital after suffering a stroke.

»

Kingsley V. Schroeder has been named chief geologist of Sun Oil Company's Beaumont Division, succeeding **Dr. C. B. Claypool,** resigned. Schroeder entered Sun's employ in the sales department in 1933, shortly after his graduation from Colgate University with a degree in geology. He was transferred to the production department in the Beaumont Division in 1936 and soon afterwards moved to the geological department.

»

G. F. Ray and **Harlan Ray,** Dallas oil producers, and **Dave R. Harris,** former drilling superintendent for Schoenfeld, Hunter & Ketch, Tulsa, have organized the Ray-Harris Drilling Company. Operating headquarters are at Midland. **Walter Tucker,** former tool pusher for Loffland Bros. Company, has been engaged as superintendent of drilling.

»

Jack Malloy, assistant Fort Worth division landman for Stanolind Oil & Gas Company, has been transferred to Oklahoma City as district landman, and is succeeded at Fort Worth by **John H. Thompson,** who has been district landman for the Texas Panhandle at Amarillo. **H. E. Thomson,** formerly at Oklahoma City, relieved Thompson at Amarillo.

»

C. Taylor Cole, Midland, Texas, consulting geologist and oil operator, was elected president of the Junior Chamber International at its World Congress in Dallas February 22.

Dr. Everette L. DeGolyer, Dallas geologist, has been elected a member of the board of directors of Southern Pacific Company. Dr. DeGolyer is the first Texan ever to be elected to Southern Pacific's board of directors. He will fill the vacancy created by the death of **Walter Douglas** of New York and Phoenix, Ariz.

»

George H. Clark, senior geologist, has been promoted to division geologist, South Texas Division, producing department, The Texas Company, effective March 1.

»

William T. O'Gara, who recently completed three years of service in Colombia for Tropical Oil Company, has joined the geology teaching staff of Texas Christian University at Fort Worth.

»

M. C. Dupree, transportation manager for Ashland Oil & Refining Company, Ashland, Ky., has been appointed chairman of a special radar committee of the American Waterways Operators, Inc., which will soon begin a study of the standardization of radar equipment and navigation aids on the rivers. A towboat operated by Dupree's firm on the Ohio and Mississippi rivers last year became the first boat on the nation's inland rivers to make use of radar for navigation.

»

W. C. Bednar, consulting petroleum engineer, has opened offices in the Palace Building, Tulsa.

»

R. O. Swayze, assistant district manager of General Petroleum Corporation's Rocky Mountain operations, has been promoted to manager of production of General Petroleum's California district and is now headquartered at Los Angeles.

»

R. E. Abbott, assistant land man with Phillips Petroleum Company at Denver, has resigned to do independent lease work in the Rocky Mountain area.

»

Meyer H. Dubrow, Fort Worth district petroleum engineer for Continental Oil Company, was elected president of the Fort Worth Petroleum Engineers Club, succeeding **Gordon H. Fisher,** Gulf Oil Corporation. Other officers **Jake C. Knoll,** Bethlehem Steel Company, vice president in charge of entertainment; **Ernest D. Brockett, Jr.,** Gulf Oil Corporation, vice president in charge of membership; **Charles Pishny,** consultant, vice president in charge of programs; and **W. A. Moncrief, Jr.,** independent, secretary-treasurer.

»

Perry E. Larson and **John T. Gage,** both of Bowie, Texas, and **William V. Coffey** of Chicago, Ill., have incorporated the Mars Drilling Corporation to operate in Texas.

»

Tom L. Sessions, W. E. Allaun and **Lanham Croley,** all of Dallas, have obtained Texas charter to operate Oil Recovery Company.

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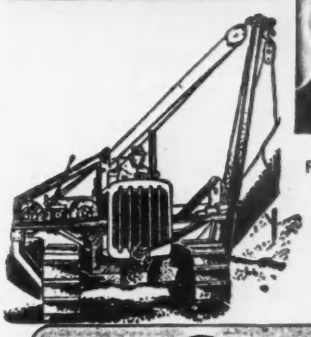

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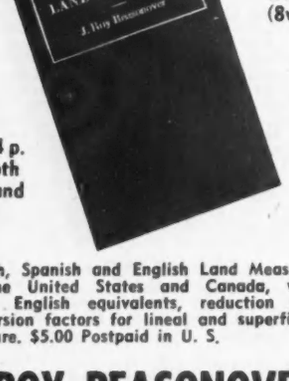

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William B. Campbell, formerly in the Army Air Forces with the rank of major, has been appointed general sales supervisor for Sperry-Sun Well Surveying Company with headquarters in Houston. Campbell participated in six campaigns in the Southwest Pacific as a general staff combat tactical and technical observer. Before the war he was sales promotion and advertising manager and also export manager for Dowell Incorporated, Tulsa. Campbell entered the oil business with Phillips Petroleum Company as general sales manager of Philfuels Company, a subsidiary. When Phillips Petroleum Utilities Company was organized he became general manager.

William B. Campbell

»

W. H. Black, Ralph Lowe and **C. K. Lowe,** all of Midland, Texas, have incorporated the W. H. Black Drilling Company to operate in Texas with capital stock of $50,000.

»

O. B. Stephens of Abilene, Texas, and **P. Crawford** of Fort Worth, and associates have organized the Onyx Oil Company to operate in West Central Texas. The firm is capitalized at $80,000.

»

Perry E. Larson and **John T. Gage,** both of Bowie, Texas, and **Charles L. Lloyd** of Chicago have incorporated Star Oil Company with paid-in capital stock of $25,000. Operating headquarters are at Bowie.

»

A. R. Hughes and **J. L. Veach,** both of Houston, have organized Martin Oil Company of Texas, capitalized at $10,000.

»

David E. Johnson has been appointed a vice president of The Steel Improvement & Forge Company, Cleveland. He has been in charge of production operations as superintendent for many years.

»

George C. Chatneuff has been appointed district manager of the Houston territory for Bridgeport Brass Company, with office and warehouse at 2216 Walker Avenue, Houston. Chatneuff previously was connected with Bridgeport's St. Louis office.

»

William W. (Bill) Flenniken of Halliburton Oil Well Cementing Company, Duncan, Okla., has resigned as sales manager of the firm to join Manning & Brown Drilling Corporation, of Denver, as general manager of operations.

»

Paul R. Wineman has been named manager of the Seattle district of the Industrial Products Sales division of The B. F. Goodrich Company, succeeding **Fred D. Ranyard,** who retired after nearly 36 years of company service.

Ralph K. Davies, wartime deputy petroleum administrator, has purchased *Script* magazine, published in Los Angeles. **R. L. Smith,** executive vice president and general manager of the Los Angeles *Daily News,* is associated with Davies.

»

L. M. Morley has been elected a vice president of the Minneapolis-Honeywell Regulator Company. Morley, vice president in charge of sales for Brown Instrument Company, a wholly-owned Honeywell subsidiary at Philadelphia, will continue to supervise sales of the industrial control devices made by the Brown division.

Deaths

Col. Robert Wright Stewart, 80, former chairman of the board of Standard Oil Company of Indiana, died February 24 in Miami Beach, Fla. Known as a lawyer, soldier and industrial leader, Stewart was ousted as chairman of the board in 1929 in a vote battle for control of the company, which **John D. Rockefeller, Jr.,** won. In addition to his affiliation with Standard Oil, he also was an executive of the Fulton Fire Insurance Company and a trustee of the National City Bank, both of New York, and the Continental Illinois Bank and Trust Company of Chicago. Col. Stewart was born March 11, 1866, at Cedar Rapids, Iowa, and joined Standard as general attorney in 1907.

»

C. Dwight Avery, 69, senior geologist of U. S. Geological Survey, Washington, D. C., died in Takoma Park, Md., February 1. A native of Galesville, Wis., Avery was a graduate of the Michigan School of Mines and past president of the District of Columbia Section, American Society of Civil Engineers. He had been a member of AAPG since 1928, and served for many years with the U. S. General Land Office. Since 1920 when he became associated with the Geological Survey, he had been engaged in the classification of mineral lands.

»

J. B. Hudson, 84, a long-time driller, died at Retsil, Wash., February 12. Hudson was born in Venango County, Pennsylvania, and worked in virtually every oil-producing country in the world.

»

Albert N. Eby, 43, Houston, geophysicist for The Superior Oil Company, died February 22. A native of Waco, Eby had resided in Houston 14 years.

»

O. C. Brewer, 49, Houston, a warehouse supervisor for Humble Oil & Refining Company for 18 years, died February 25.

»

Robert T. Wilson, president of La Gloria Corporation and Reynosa Pipe Line Company, died February 21 in Corpus Christi, Texas, where he was mayor.

Administrative Personnel Changes Made by Black, Sivalls & Bryson

Three changes in the administrative personnel of Black, Sivalls & Bryson's Kansas and Northwestern territories have been announced.

Ed Nelson

Ed Nelson, who for several years worked with J. A. Grubb, killed January 28 in an auto accident, has been transferred from the Propane system sales force in Kansas City to Great Bend, Kansas, where he will direct the Kansas operations.

Marion Miller, who was Grubb's assistant in the Wichita sales office, will be in charge of the office.

Lee Kelton will be district manager in charge of the Connor Tank Division in Wyoming and Colorado.

400 Equipment Distributors See International Harvester Exhibit

An exhibit of all types of power and equipment for earth-moving and construction was reviewed on February 12 by 400 industrial equipment distributors and 200 others at the Melrose Park headquarters of International Harvester's industrial power division. The show was unusual in that 32 other manufacturers had machines on display in addition to International's complete line of crawler tractors, industrial wheel tractors, and diesel and gasoline engines. All of this equipment consisted of machines mounted on International crawler or wheel type tractors or self-powered equipment built by manufacturers using International power.

The exhibit provided the most complete picture of industrial equipment ever presented, in the opinion of company officials. The show occupied a 40,000-square foot section of the Melrose Park plant.

The 400 industrial distributors who visited the display were in Chicago for the Associated Equipment Distributors' convention.

Two Officials Given Promotions By Cummins Engine Company

Promotions of two officials of the Cummins Engine Company, Columbus, Ind., builder of diesel engines, were announced by Hugh Th. Miller, chairman of the board of directors.

V. E. McMullen is now executive vice president and R. E. Huthsteiner is vice president and general manager.

The management also announced the appointments of Leonard W. Beck as general sales manager and Waldo M. Harrison as controller.

Ladish Changes Name

Ladish Drop Forge Company, Cudahy, Wis., has changed its name to Ladish Company "to better reflect the expanded scope of our operations and products."

Superior Engine Division Opens Regional Office at New Orleans

The Superior Engine Division of The National Supply Company has opened a Southeastern regional office at 531 Gravier Street, New Orleans, according to Robert M. Pearson, manager of sales. R. E. Hoffmann, who has been manager of the division's office at Jacksonville, Fla., will be manager of the new regional office.

R. E. Hoffmann

J. F. Tucker, Jr., field service engineer for the Oil Field Machinery and Equipment Division of The National Supply Company, also will have his office at the new address.

George R. Allen Named General Sales Manager for Kerotest

George R. Allen has been named general sales manager for Kerotest Manufacturing Company. Allen, associated with Kerotest for several years, was formerly sales manager of the Brass Valve Division.

Stanley J. Roush, executive vice president, said the appointment was made in a move to combine the entire sales operations of the company for both and brass steel valves under one head.

The growing emphasis on LP-gas was also a factor which helped set a policy of over-all sales operations plus a growing trend of intermingling brass and steel in smaller valve applications in many types of industries.

Diesel Engine Manufacturers Plan Session in New Orleans

Advantages of diesel engines in cargo ships, tankers, workboats and other vessels, together with the best practices in diesel engine maintenance and usage will be discussed by the Diesel Engine Manufacturers Association at a Gulf Coast marine conference March 20 at the Roosevelt Hotel in New Orleans.

The conference is the second in a series, according to E. J. Schwanhausser, president of the association. The first was held in November at San Francisco.

Professors' Conference Announced By Diesel Engine Manufacturers

A one-week educational conference for college professors who teach courses in Diesel engineering has been announced by the Diesel Engine Manufacturers Association. During the week of June 23, 50 professors will headquarter at Chicago. They will visit engineering laboratories of the Illinois Institute of Technology and of Northwestern University, and will make factory tours of the General Motors plant at LaGrange and the International Harvester Company in Chicago.

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Ball and DeGolyer Listed As Texas Banquet Speakers

The annual banquet of the North Texas Oil & Gas Association will be held in Wichita Falls, March 8, with Max W. Ball, director of the Oil and Gas Division of the Department of Interior, and E. DeGolyer, nationally known petroleum engineer and geologist, as speakers.

Preceding the banquet the secondary recovery committee of the association will conduct an all-day session with speakers at the morning period to include W. J. Murray, Jr., Austin, member of the Texas Railroad Commission; Paul D. Torrey, Houston, consulting engineer; H. M. McClain, petroleum engineer, Magnolia Petroleum Company, Dallas; Don Martin, Hercules Powder Company, Wilmington, Del., and D. B. Taliaferro, Bureau of Mines, Wichita Falls.

The afternoon session will be an open forum on secondary recovery. A panel, including R. C. Earlougher, Tulsa; W. A. Heath, Tulsa; Dr. G. H. Fancher, Austin; Jo H. Cable and Gordon Stine, Wichita Falls, will answer questions submitted by the audience.

President Bowes of INGA Lists Committee Chairmen

Chairmen of committees of the Independent Natural Gas Association of America have been appointed by President Joseph Bowes, as follows:

Regulatory practices, A. B. Harper, Arkansas-Oklahoma Gas Company, Fort Smith, Ark.; research and engineering, E. C. Joullian, Consolidated Gas Utilities Corporation, Oklahoma City; producers, D. D. Harrington, Hagy, Harrington and Marsh, independent producers, Amarillo, Texas; royalty owners, Homer W. Long, royalty owner, Guymon, Okla.; reserves and statistics, William H. Wildes, Republic Natural Gas Company, Dallas; transportation, D. A. Hulcy, Lone Star Gas Company, Dallas; membership, C. H. Zachry, Southern Union Gas Company, Dallas.

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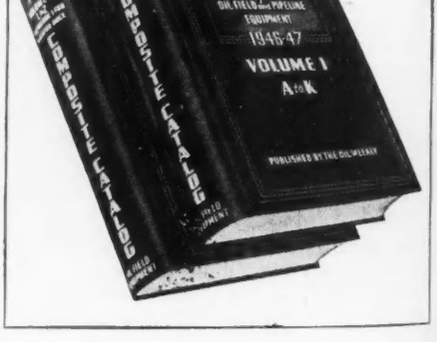
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